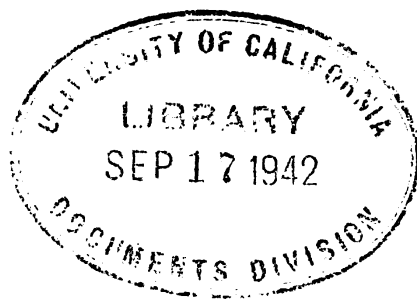


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WAR DEPARTMENT
~~U.S. Dept. of Army~~
TECHNICAL MANUAL

U. S. RIFLE, CALIBER .22,
M1922, M1922MI, AND M2



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TECHNICAL MANUAL }
No. 9-280



WAR DEPARTMENT,
WASHINGTON, October 1, 1940.

U. S. RIFLE, CALIBER .22, M1922, M1922MI, AND M2

Prepared under direction of the
Chief of Ordnance

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SECTION I GENERAL

	Paragraph
Purpose	1
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References	3

1. **Purpose.**—This manual is published for the information and guidance of the using arms and services.

2. **Scope.**—*a.* This manual contains all the essential information of a technical character required by the using arms for the identification, use, and care of the matériel described. In addition to describing the weapon, it contains essential information required to identify, use, and care for the ammunition, spare parts and accessories, and cleaning and preserving material.

b. The disassembling outlined in this manual is the only disassembling which the using troops are authorized to perform.

3. **References.**—All publications to be used in conjunction with this manual are shown in the Appendix.

*This pamphlet supersedes TR 1300-22A, December 10, 1936.

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SECTION II

DATA AND GENERAL NOTES

Data.....	Paragraph 4
General notes.....	5

4. Data.

a. Dimensions.

(1) Barrel.

Caliber of bore.....inches... 0. 22

Diameter of bore.....inches-- { Minimum -- 0. 218
Maximum -- 0. 2185

(2) Rifling.

Number of grooves..... 4

Twist, uniform, R. H., one turn in.....inches.. 16

Height of front sight above center line of bore...do.... 1. 067

(3) Stock.

Length with butt plate:

M1922MIdo.... 31. 235

M2do.... 31. 215

Crook, that is, distance from center line of bore to heel of butt:

M1922MIinches.. 2. 2

M2do.... 1. 75

Distance from trigger to rear face of butt plate, parallel with center line of bore:

M1922MIinches.. 13. 21

M2do.... 13. 15

Length of gun complete:

M1922MIdo.... 43. 625

M2do.... 44. 375

Sight radius.....do.... 27. 5

(4) Elevation and windage. See paragraph 49.

b. Weights.

Total weight of rifle.....pounds.. 8. 75

Trigger pull measured at middle point of bow of trigger (tentative).....pounds.. 4 to 5

5. General notes.—a. The trigger of the M1922MI rifle must not be snapped unnecessarily without a cartridge in the chamber as this may result in injury to the firing pin. For practice purposes a fired case should be placed in the chamber. The trigger of the M2 rifle may be snapped on an empty chamber without causing damage.

b. In using the rifle, before starting a score it is important to first push a dry patch through the bore, then fire two or three so-called fouling shots to warm the barrel as an oily barrel will generally give a wild shot.

c. In order to insure a reasonably accurate life for the rifle, the utmost care must be taken to prevent corrosion or rusting of the bore. After firing the barrel should be properly cleaned as soon as possible, and in no case should the rifle be allowed to stand overnight without such cleaning.

d. It is a well-known fact that some makes and lots of caliber .22 ammunition may give good accuracy in one individual rifle and mediocre to poor results in another individual rifle. Thus a rifle should not be condemned as inaccurate because of results obtained with a particular make or lot of ammunition. If the bore appears to be in good condition and the mechanism is clean, it will probably give excellent accuracy with some other make or lot of ammunition.

e. When the bore of a rifle becomes badly pitted it will shoot inaccurately and lead excessively. No amount of cleaning will restore such a bore. The rifle should be turned in to an ordnance establishment to have a new barrel fitted. Such a condition of the bore is always caused by neglect.

SECTION III

DESCRIPTION

	Paragraph
General.....	6
Groups and assemblies.....	7

6. General.—The caliber .22 pattern of rifle described in this manual was initially developed by the Ordnance Department with the assistance of the National Rifle Association to provide an accurate small-bore weapon for the use of civilian rifle clubs (AR 850-100), for use in rifle competitions in schools and colleges (AR 850-110), and for sale purposes to members of the National Rifle Association. Subsequently, the weapon was adopted for use in small-bore rifle marksmanship courses throughout the Army, Navy, Marine Corps, and Coast Guard. The rifles assembled for use of rifle clubs have the NRA type of stocks and butt plates (shotgun type), while those assembled for military use have the military type stocks and butt plates.

a. Designations.—As initially produced the weapon was designated as rifle, U. S., caliber .22, M1922. Successive improvements have been indicated by the designations M1922MI and M2. In general, these

changes in designations were caused by major improvements in the bolt and/or firing mechanism, and may be applied to any model.

b. Nature of improvements.—(1) The rifle as initially designed and designated as U. S. rifle, caliber .22, M1922 (fig. 1), contained the bolt, M1922 assembly, which included a double-point striker and a headed cocking piece. The M1922 magazine assembly which projects below the floor plate and a No. 48B Lyman receiver sight which has five graduations to one complete revolution of the elevating and windage

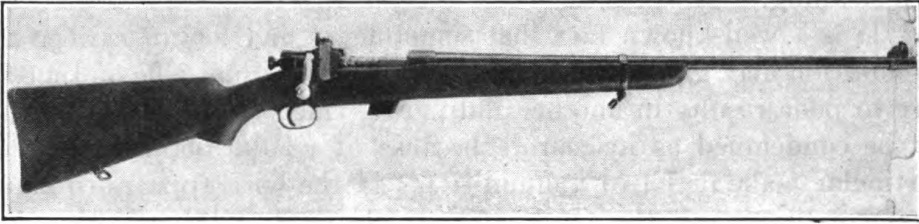


FIGURE 1.—U. S. rifle, caliber .22, M1922.

Ord. 9555

screw knobs were also used. Most of these rifles were assembled with the NRA type of stock (stock, M1922 assembly) and shotgun type of butt plate (plate, butt, M1922). Nearly all of them now have later type bolts and magazines, and the sights have been changed to accord with the No. 48C Lyman receiver sight in general use on subsequent models. Therefore, parts specially designed for this model will not be stocked or issued.

(2) The first improvement in the initial design designated as U. S. rifle, caliber .22, M1922MI (fig. 2), included the bolt with the

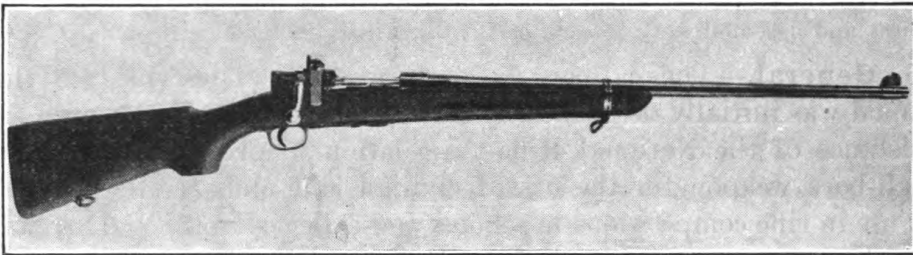


FIGURE 2.—U. S. rifle, caliber .22, M1922MI.

Ord. 9556

M1922MI firing mechanism assembly, the M1922MI magazine assembly, and the No. 48C Lyman receiver sight. The improved bolt permitted more accurate head space adjustment which is critical in such a small-bore weapon. The new magazine was made to set flush with the floor plate, and the new sight provided 10 graduations to 1 complete revolution of the elevating and windage screws. All these improvements may and probably have been applied to all the M1922 rifles except those sold to individuals.

(3) The second improvement was in two stages and is incorporated in the weapon designated as U. S. Rifle, caliber .22, M2 (fig. 3). The first stage included a redesigned M2 bolt assembly, M2 magazine assembly, and M2 stock assembly. Approximately 3,800 rifles were so assembled. The second stage was a redesign of the bolt handle assembly to incorporate an adjustable head space feature. Bolt handles of the first-stage design will be replaced with bolt handles containing the adjustable head space feature as the rifles containing them are turned in for overhaul. In addition to the adjustable head space feature, the following improvements have been incorporated in this model:

(a) Fall of firing pin has been reduced to one-half that of the previous model.

(b) Bolt and magazine design permits the uppermost cartridge to be in line with the chamber, thus reducing feed jams.

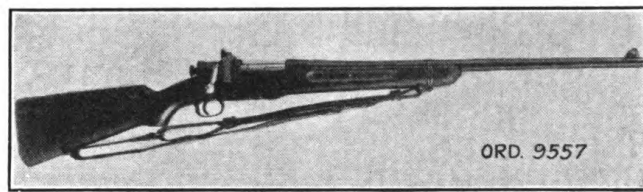


FIGURE 3.—U. S. rifle, caliber .22, M2.

(4) The improvements incorporated in the U. S. rifle, caliber .22, M2, may also be incorporated in rifles of preceding designs by replacement of both the bolt with the M2 firing mechanism group assembly and the M2 magazine assembly. This will be done as rifles require overhaul, and parts for rifles of preceding designs will therefore be stocked in limited quantities for sale purposes only.

c. Ammunition.—(1) In the design of any weapon many factors other than the form of cartridge must be considered such as pressure, head space, and safety limits. This weapon is designed to use one type of cartridge, namely, cartridge, ball, caliber .22, long rifle, with an initial velocity of approximately 1,080–1,100 feet per second and a chamber pressure of approximately 16,000 pounds per square inch. Commercial manufacturers have recently brought out cartridges of this type, but of higher velocities and creating higher pressures. These higher velocity cartridges are not issued by the Ordnance Department.

(2) Users of the weapons who are not familiar with the mechanics of firearms may discover that other types of caliber .22 cartridges will fit or may be fired in the rifle. The informed user is aware that other cartridges may be fired, but is also aware of increased chances of

damage to his weapon. Cartridges other than the type for which the weapon is designed may so affect accuracy as to render the rifle unfit for use. Figure 71 shows results brought about by use of a shorter cartridge than that for which the rifle is designed.

7. Groups and assemblies.—For convenience the parts of the rifle have been listed together in groups and assemblies. A group is a number of parts which function together and which are naturally intimately related to each other and should therefore be considered together. An assembly consists of two or more parts which are either permanently or semipermanently assembled and should not ordinarily be taken apart. An assembly frequently is issued as a unit for maintenance purposes. The groups, assemblies, and individual parts are listed in the different paragraphs of section IV in the order in which they would be taken from the rifle in case the latter was completely disassembled.

SECTION IV

DETAILED DESCRIPTION OF ASSEMBLIES, GROUPS, AND PARTS

	Paragraph
Bolt with firing mechanism group-----	8
Ejector stop group-----	9
Magazine assembly-----	10
Floor plate-----	11
Trigger guard group-----	12
Magazine retaining spring-----	13
Lower band group-----	14
Sear and trigger group-----	15
Rear sight assembly-----	16
Front sight group-----	17
Barrel and receiver assembly-----	18
Butt plate-----	19
Butt plate screws-----	20
Butt swivel assembly-----	21
Butt swivel screws-----	22
Stock assembly-----	23

8. Bolt with firing mechanism group.—The bolt and firing mechanism group can be removed from the rifle as a unit and includes—

a. Extractor.—(1) The extractor M1922MI and the extractor M2 (fig. 4) are identical except the dimensions and the contour of the hook (A). Figure 5 is an enlarged view of the end of the M1922MI and the M2 extractor and shows the difference in contour of the hook. It is highly important that the extractor be not interchanged. For

identification purposes the model number is stamped on the upper surface of the extractor. Manufacture of the M1922MI extractor has been discontinued except for sales purposes.

(2) Figure 4 shows the side view of the extractor. At the front end of the extractor there is a hook (A) by which the cartridge case is extracted from the chamber. The tongue (B) rides in its groove at the front of the bolt head. The lug (C) is undercut and acts as a catch to hold the extractor in the bolt head.

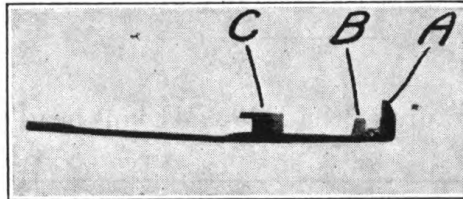


FIGURE 4. Ord. 9558

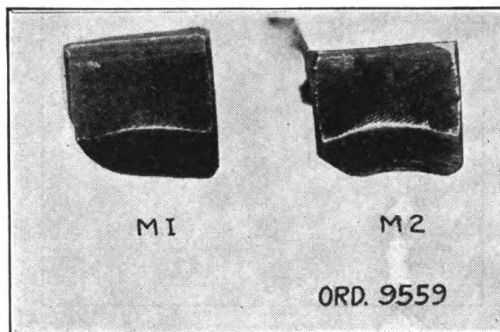


FIGURE 5.

b. Bolt head assembly.—Figure 6 shows the left side view of the bolt head assembly, M1922MI, and figure 7 shows the left side view of the bolt head assembly, M2. The front end views of the M1922MI and M2 being identical, this view is shown in figure 8. The bolt

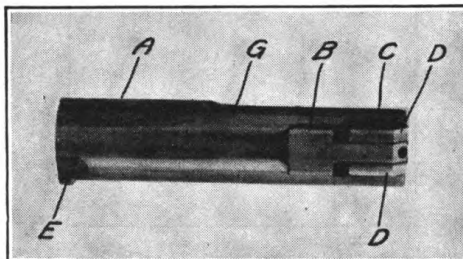


FIGURE 6. Ord. 9560

head assembly consists of the bolt head (A), ejector (B), ejector retaining pin (C), and the ejector spring (not shown in cut). The

bolt head has the guide lugs (D), the latch lug (E), the firing pin hole (F), the magazine clearance groove (G), and the extractor

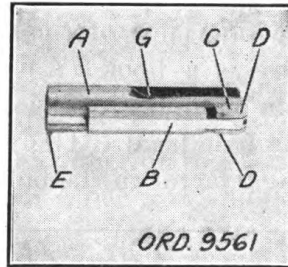


FIGURE 7.

slot (H). Manufacture of the M1922MI bolt head assembly has been discontinued.

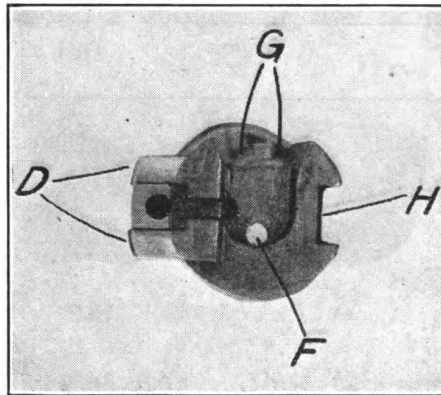


FIGURE 8.

c. Bolt handle assembly.—(1) *M1922MI.*—The bolt handle assembly, M1922MI (fig. 9, top view, and fig. 10, rear end view), consists of the bolt handle (A), the bolt head latch (B), the bolt head latch

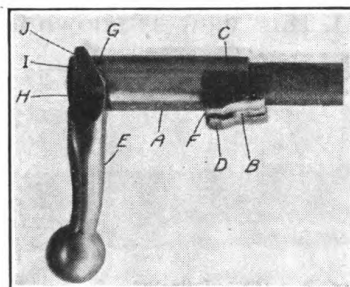


FIGURE 9. Ord. 9563

pin (C), the bolt head latch plunger (D), and the bolt head latch spring (not shown in cut). The bolt handle has the handle (E), the locking lug (F) which sustains the shock of the discharge, the

extractor cam (G), the bolt sleeve clearance (H), the safety lock spindle notch (I), the bolt sleeve lock notch (J), the cocking cam (K), and the cock notch (L). Manufacture of this item has been discontinued.

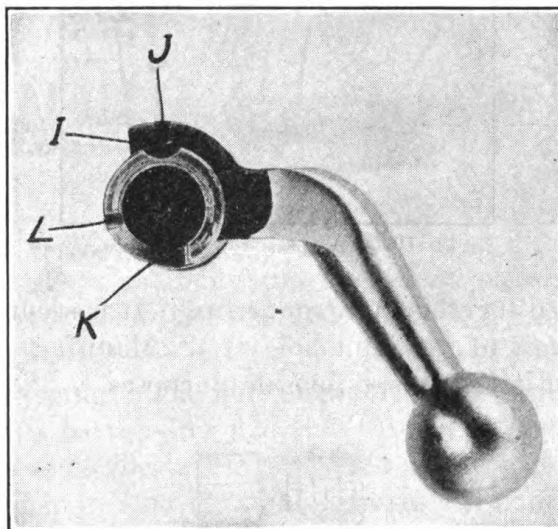


FIGURE 10.

Ord. 9564

(2) *M2*.—The bolt handle assembly, *M2*, shown in figure 11 consists of the bolt handle, the head space adjusting screw, and the head space adjusting screw locking plug. The head space adjusting screw

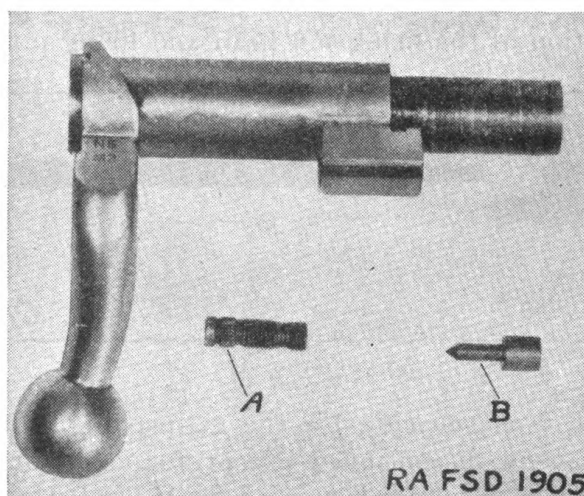


FIGURE 11.

(A) and the head space adjusting screw locking plug (B) are shown disassembled from the bolt handle. The screw and plug should not be removed or disassembled except when necessary to adjust the head space and then only by qualified ordnance personnel.

d. Striker assembly (not used on M2).—The striker assembly (fig. 12) consists of the firing pin head (A) and the striker (B) permanently assembled together in manufacture. It is secured to the firing pin rod by means of the joint hole (C). Manufacture of this item has been discontinued except for sale purposes.

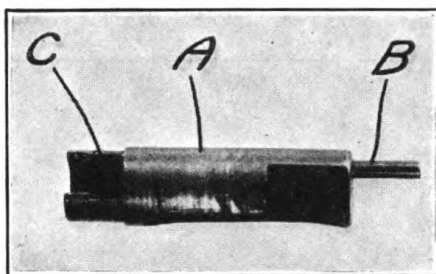


FIGURE 12. Ord. 9566

nently assembled together in manufacture. It is secured to the firing pin rod by means of the joint hole (C). Manufacture of this item has been discontinued except for sale purposes.



Ord. 9567

FIGURE 13.

e. Firing pin sleeve (not used on M2).—The firing pin sleeve (fig. 13) fits over the front end of the firing pin rod and the rear end of the firing pin head, covering the joint hole and preventing accidental separation of the firing pin head and firing pin rod. Its rear

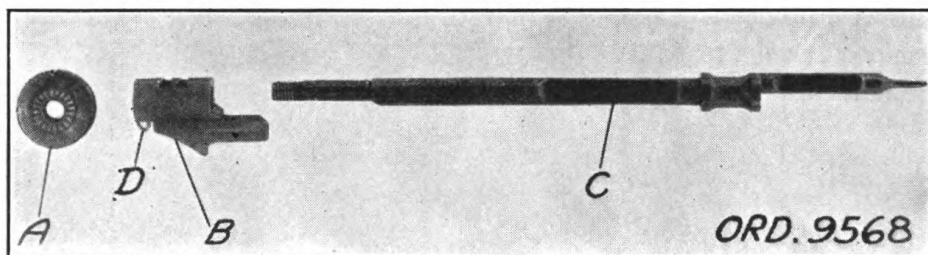


FIGURE 14.

end forms the front bearing for the mainspring. Manufacture of this item has been discontinued except for sale purposes.

f. Firing pin group assembly (used on M2 only).—The firing pin group assembly shown in figure 14 includes the firing pin nut (A), the cocking piece assembly (B), and the firing pin (C). The cocking piece assembly consists of the cocking piece and the locking spring (D).

g. Mainspring.—The mainspring, M1922MI, is shown in figure 15. The mainspring M2 is identical except it is longer in over-all length. It is the same mainspring used in the U. S. rifle, caliber .30, M1903. Manufacture of the mainspring, M1922MI, has been discontinued except for sale purposes.



FIGURE 15.

Ord. 9569

h. Bolt sleeve group assembly.—The bolt sleeve group assembly includes the bolt sleeve assembly and the safety lock assembly.

(1) *Bolt sleeve assembly.*—The bolt sleeve assembly consists of the bolt sleeve, the bolt sleeve lock, the bolt sleeve lock pin, and the bolt sleeve lock spring. The bolt sleeve (fig. 16, top view and left side view) has the barrel (A) which is threaded for the purpose of securing the sleeve to the bolt handle, the safety lock seat (B), the safety lock plunger groove (C), the recesses (D) for retaining the safety lock when turned to the right or left, the recess (E) for re-

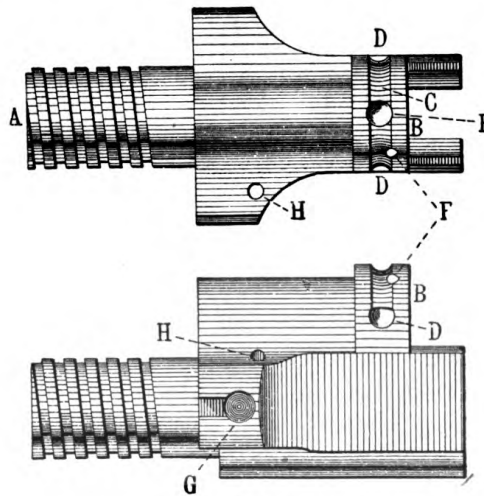


FIGURE 16.

Ord. 9570

taining safety lock in dismounting the bolt mechanism, the bevel (F) for dismounting the safety lock from the sleeve, the sleeve lock recess (G), and the sleeve lock pin hole (H). There are also the safety lock spindle and firing pin holes, the cocking piece groove, and the undercut for the rear end of the bolt handle. None of the last four are shown in the illustrations.

The bolt sleeve lock (fig. 17, left end view, and underside view) has the spindle (A) which is drilled out to receive the bolt sleeve lock

spring, the latch (B), and the bolt sleeve lock pin groove (C). It is designed to prevent accidental turning of the sleeve when the bolt is drawn back. Figure 17 also shows the bolt sleeve lock pin and the bolt sleeve lock spring.



FIGURE 17.

Ord. 9571

(2) *Safety lock assembly.*—The safety lock assembly, consisting of the safety lock thumbpiece (A), the safety lock spindle (B), the safety lock plunger (D), and the safety lock spring (C), is shown in figure 18, rear and side views. These parts are permanently assembled during manufacture. The thumbpiece has the cam (E), the locking groove (F), the cocking piece groove (G), the plunger

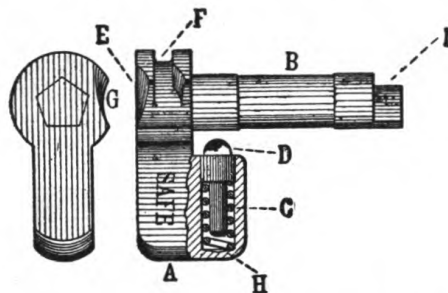


FIGURE 18.

Ord. 9572

hole (H), and the bolt handle clearance (I). The safety lock spring and plunger are shown in figures 19 and 20, respectively. The safety lock plunger projects into its groove in the bolt sleeve under action of the spring and prevents any movement of the safety lock to the rear. When the plunger is in the recesses in the groove, it retains the safety lock when it is turned either to right or left or in



Ord. 9573

FIGURE 19.



Ord. 9574

FIGURE 20.

the vertical position for dismounting the bolt mechanism. The words "SAFE" and "READY" impressed on the opposite sides of the thumbpiece indicate that the firing mechanism is locked or ready for firing.

i. *Firing pin assembly* (not used on M2).—The firing pin assembly (fig. 21) consists of the firing pin rod (A) and the cocking piece (B)

which are made separately, the former being screwed into the latter and riveted in assembling. Length of the rod is so adjusted that when the front end of the cocking piece bears against the interior shoulder of the sleeve, the striker point will project the proper distance beyond the face of the bolt. Other parts are the lug (C), cocking cam (D), nose (E), sear notch (F), locking shoulder (G), lock-

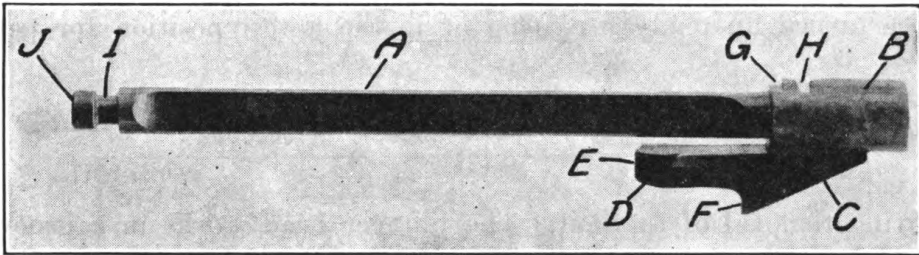


FIGURE 21.

Ord. 9575

ing groove (H), neck (I), and head (J). Manufacture of this item has been discontinued except for sale purposes.

9. Ejector stop group.—The ejector stop group includes ejector stop, ejector stop spindle, ejector stop screw, ejector stop spring, and ejector stop plunger.

a. The ejector stop (fig. 22) has thumbpiece (A), body (B), dismounting groove (C), ejector stop spindle hole (D), ejector stop

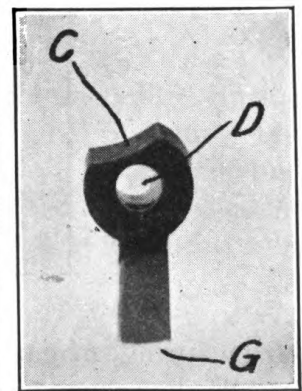
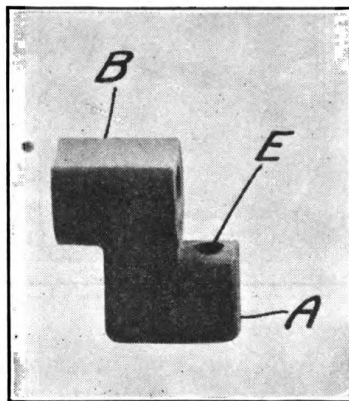
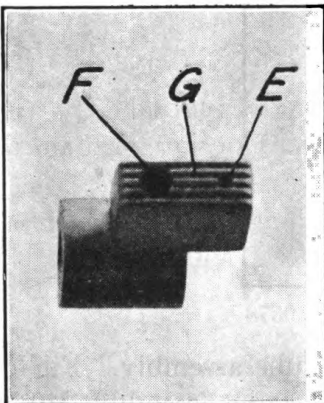


FIGURE 22.

Ord. 9576

plunger hole (E), ejector stop screw hole (F), and the serrature (G). When the ejector stop thumbpiece is turned in either up or down position and the bolt is drawn to the rear, the rear end of the ejector stops against the projecting front end of the ejector stop body. When the ejector stop thumbpiece is in the intermediate position, the dismounting groove (C) permits the bolt to be drawn entirely out of the receiver.

b. The ejector stop spindle (fig. 23) has the ejector stop screw groove (A) and the dismounting groove (B).

c. The ejector stop screw (fig. 23) goes through the ejector stop from the outer edge of the thumbpiece, its end fitting into the groove in the ejector stop spindle.

d. The ejector stop spring and the ejector stop plunger (fig. 23) retain the ejector stop in its seat in the receiver with the thumbpiece turned up ready for firing or in the lowest position for per-



FIGURE 23.

Ord. 9577

mitting removal of the bolt. The plunger head works in a groove in the left side of the receiver, which has small notches corresponding to the above positions of the ejector stop.

10. Magazine assembly.—The magazine assembly, M1922MI, cannot be used with the bolt mechanism, M2, and the magazine assembly, M2, cannot be used with the bolt mechanism, M1922MI. In view of this lack of interchangeability the M1922MI magazine assembly will be stocked until all M1922MI bolt assemblies have been replaced. The magazine assembly includes magazine base, mag-

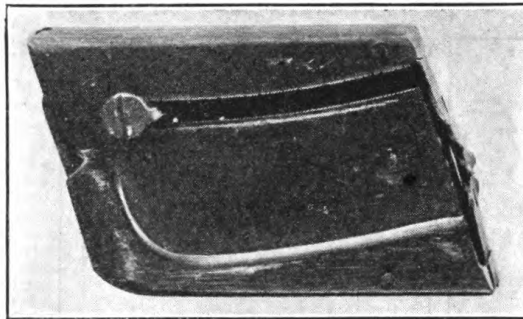


FIGURE 24.

Ord. 9578

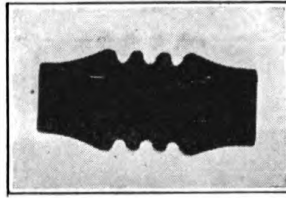
azine spring, magazine follower, and magazine tube assembly. Figure 24 shows magazine assembly, M1922MI. Magazine assembly, M2, and magazine assembly, M1922MI, are identical except for the magazine tube assembly.

a. The magazine base, top or inside view, is shown in figure 25.

b. The magazine spring is shown in figure 26, side view and end view.

c. The magazine follower (fig. 27, top view and right side view) has the guide lugs (A) and top surface (B) which serve to locate the cartridges in the magazine and guide the last cartridge into the

chamber. The thumbpiece (C) with serrature (D) is used to compress the magazine spring while loading the magazine.



Ord. 9579

FIGURE 25.

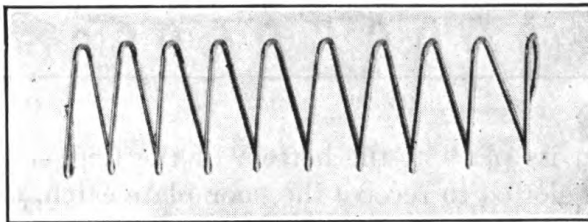
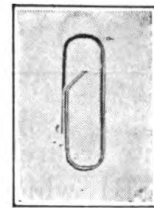


FIGURE 26.



Ord. 9580

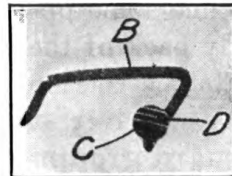
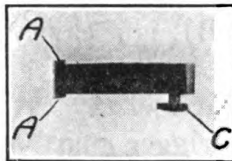
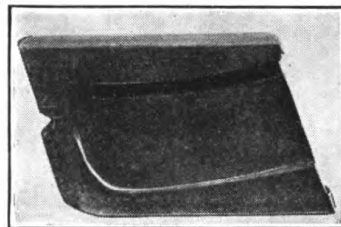


FIGURE 27.

Ord. 9581

d. The magazine tube assembly is permanently assembled during manufacture and consists of the magazine side, right; magazine side, left; magazine ribs, front and rear; and magazine pins, long and short. This assembly should never be disassembled. The magazine tube assembly, M1922MI, is shown in figure 28. The magazine tube



Ord. 9582

FIGURE 28.

assembly, M2, and the magazine tube assembly, M1922MI, are similar in outward appearance but have different dimensions and a different location of the magazine retaining spring recess.

11. Floor plate.—The floor plate (fig. 29, inside view) has the tenon (A), which fits into a groove at the front end of the trigger guard, and with the assistance of the floor plate catch retains the

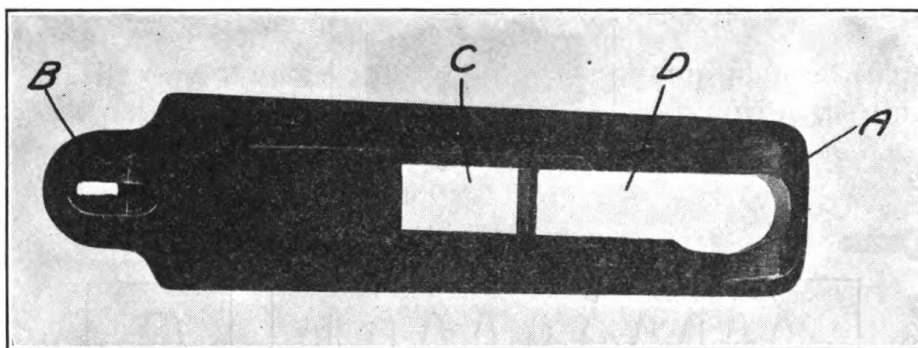
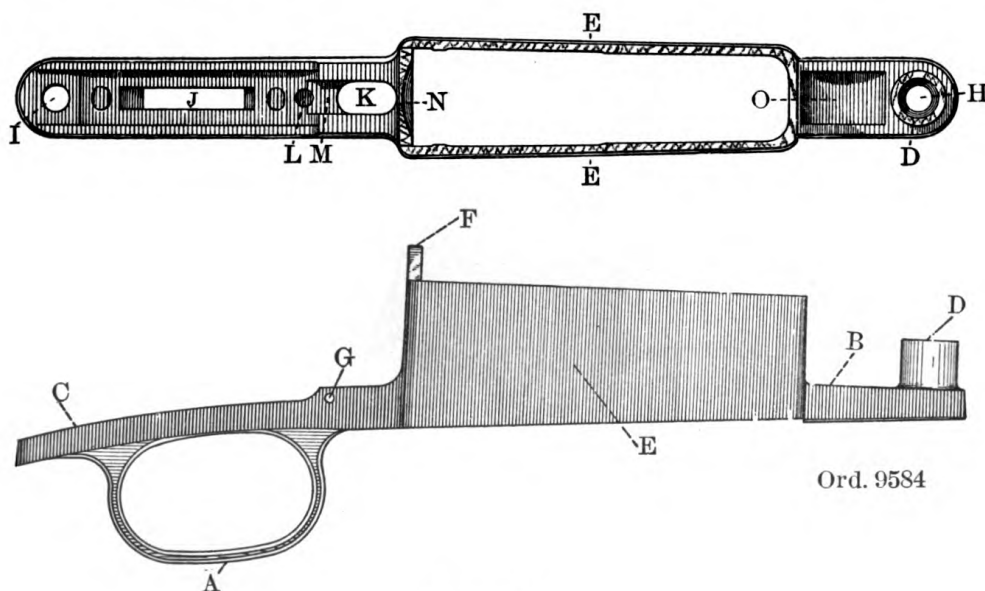


FIGURE 29.

Ord. 9583

floor plate securely in its place at the bottom of the trigger guard; the lug (B), which is slotted to receive the floor plate catch, and has a tenon on its front end which fits into a slot in the trigger guard; the opening (C) through which the magazine retaining spring projects; and the magazine opening (D). Not shown in figure 29, but located directly back of the lug (B), is a cavity through which the floor plate catch is released by means of a caliber .30 service cartridge, small screw driver, or similar tool.

12. Trigger guard group.—The trigger guard group includes—
a. Trigger guard (fig. 30, top view and right side view) having



Ord. 9584

FIGURE 30.

the guard bow (A), front tang (B), rear tang (C), front guard screw stud (D), walls (E), positioning tang (F), floor plate catch pin hole (G), front guard screw hole (H), rear guard screw hole (I), trigger slot (J), floor plate lug slot (K), floor plate catch spring hole (L), floor plate catch slot (M), ramp (N), and the lightening cut (O).

b. Floor plate catch (fig. 31) retains the floor plate in its seat.

c. Floor plate catch pin (fig. 32) retains the floor plate catch in position and operates as a pivot for the catch.

d. Floor plate catch spring (fig. 33) maintains a tension on the floor plate catch.



Ord. 9585
FIGURE 31.



Ord. 9586
FIGURE 32.



Ord. 9587
FIGURE 33.

e. Rear guard screw (fig. 34).

f. Front guard screw (fig. 35) which is the same as the rear guard screw except that it is shorter.



Ord. 9588
FIGURE 34.



Ord. 9589
FIGURE 35.

13. Magazine retaining spring.—The magazine retaining spring (fig. 36, right side view, and fig. 37, bottom view) has the

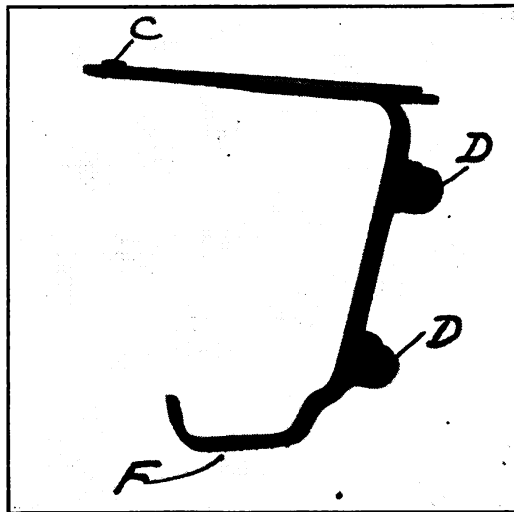


FIGURE 36.

Ord. 9590

tongues (A and B) which slide into undercuts in the receiver until the lug (C) springs into its hole in the receiver; the ears (D) which act as guides for the magazine; and the shoulder (E) which en-

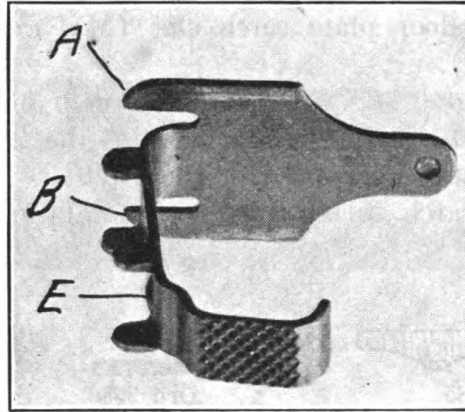


FIGURE 37. Ord. 9591

gages a recess cut in the magazine when the magazine is put in the rifle and holds the magazine in place until released by pressure on thumbpiece (F).

14. Lower band group.—The lower band group includes the lower band, the lower band screw, and the lower band swivel.

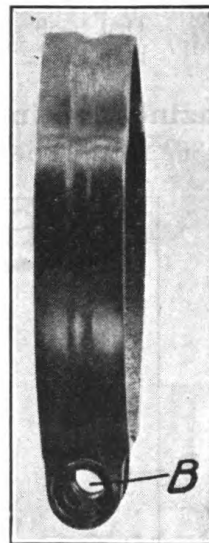
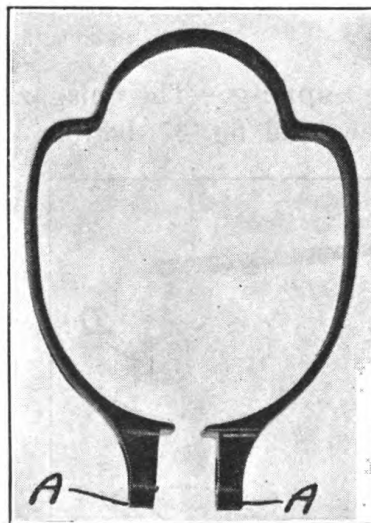


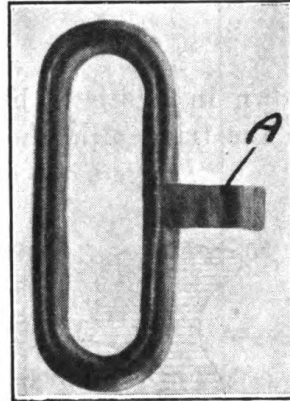
FIGURE 38.

Ord. 9592

a. The lower band (fig. 38) has the ears (A) and the screw holes (B); the front or upper end is designated by the letter "U", which should be assembled with open end facing the muzzle. The lower

band is split between the ears in order to give better adjustment to the stock and barrel and permit removal of the band without driving out the retaining pin.

b. The lower band swivel (fig. 39) is hinged by its lug (A) between the ears of the lower band.



Ord. 9593

FIGURE 39.

c. The lower band screw (fig. 40) serves to hinge the lower band swivel between the ears of the lower band.



Ord. 9594

FIGURE 40.

15. Sear and trigger group.—The sear and trigger group includes sear, sear spring, sear pin, trigger, and trigger pin.

a. The sear (fig. 41, top view, and fig. 42, right side view) has the sear nose (A), sear pin hole (B), trigger slot (C), trigger pin hole (D), and the sear spring seat (E).

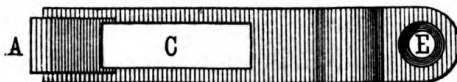


FIGURE 41. Ord. 9595

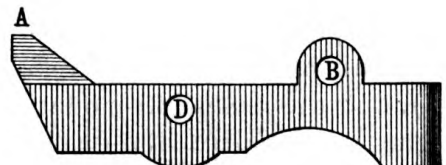


FIGURE 42. Ord. 9596

b. The sear spring (fig. 43) is seated in the sear spring seat of the sear, its upper end bearing against the receiver.

c. The sear pin (fig. 44) hinges the sear in the receiver.

d. The trigger (fig. 45, right side view and front view) has finger-piece (A), bearing (B), trigger pin hole (C), heel (D), and stop (E).



Ord. 9597

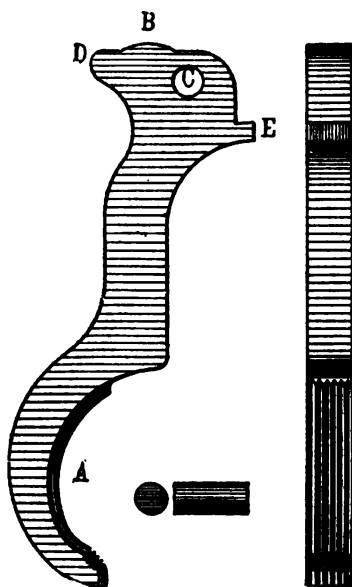
FIGURE 43.



Ord. 9598

FIGURE 44.

e. The trigger pin shown in figure 45 hinges the trigger to the sear by passing through the trigger pin holes (C and D) in these two parts, respectively.



Ord. 9599

FIGURE 45.

16. Rear sight assembly.—a. The rear sight assembly (fig. 46, rear view and right side view) is known as the Lyman receiver sight No. 48C. Components of this sight are shown in figure 47. This sight is purchased from the manufacturer and attached to the receiver as a unit by means of the rear sight-mounting screw, long (123, fig. 47), and the rear sight-mounting screw, short (124, fig. 47). As the sights are repaired, those containing 5 graduations to 1 turn of the elevating and windage screw knobs will be replaced by the 10 graduated parts.

b. When the caliber .22 rifle is used for antiaircraft training, it is necessary to remove the rear sight aperture (107, fig. 47) and substitute the antiaircraft rear sight aperture (fig. 48).

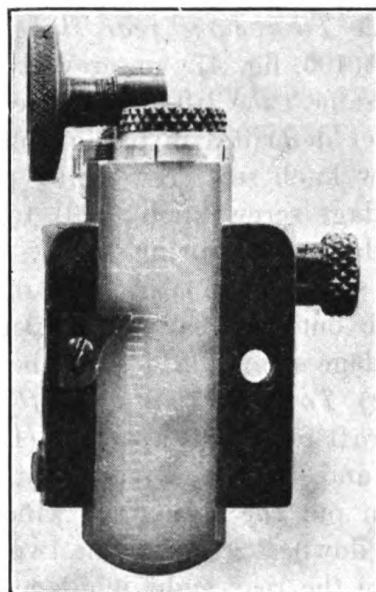
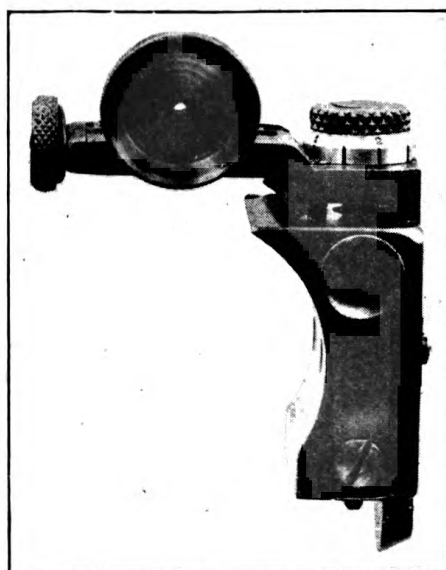


FIGURE 46.

Ord. 9600

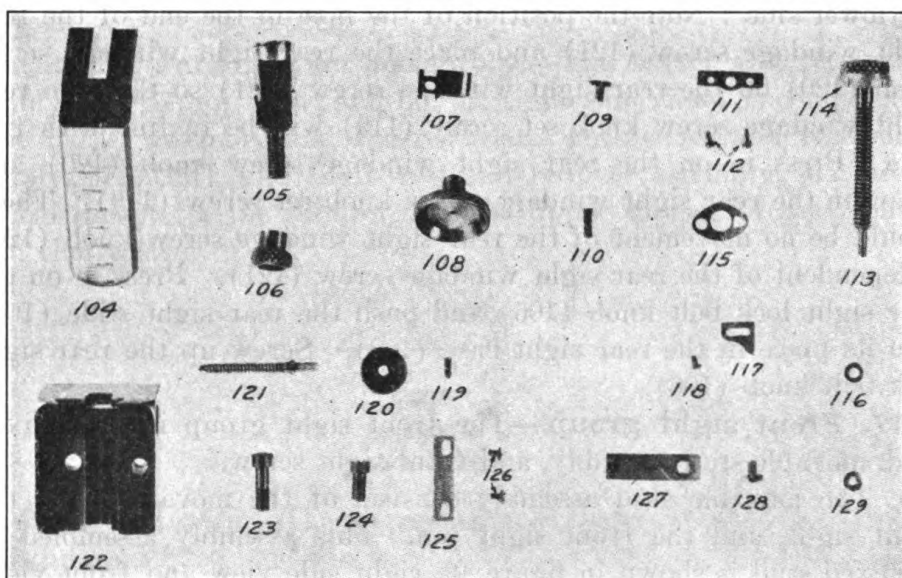


FIGURE 47.

Ord. 9264

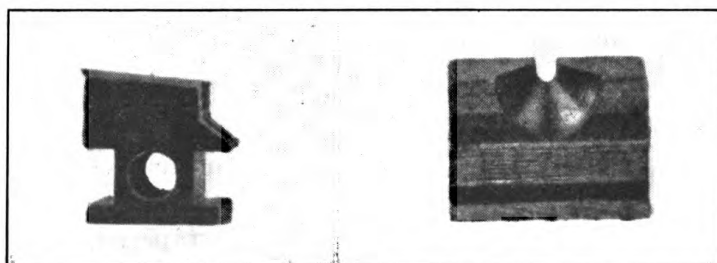


FIGURE 48.

Ord. 9601

(1) *To remove rear sight aperture.*—With the rear sight lock bolt (106, fig. 47) unscrewed as far as possible, press it in, and at the same time lift out the rear sight slide (104). With the screw driver described in paragraph 53*d*, unscrew the rear sight windage screw knob set screw (119) part way. This allows the rear sight windage screw knob (120) to be removed. Lift off the rear sight windage click spring (115). Unscrew the two rear sight windage cap screws (112) and lift off the rear sight windage cap (111). Slide out the rear sight aperture (107). Unscrew the rear sight windage screw (121) from the rear sight aperture (107).

(2) *To install antiaircraft rear sight aperture.*—Place the anti-aircraft rear sight aperture (fig. 48) on the rear sight slide (104, fig. 47) and screw the rear sight windage screw (121) all the way in. Then put the rear sight windage cap (111) in place with the flat side down. Screw in the two rear sight windage cap screws (112). Place the rear sight windage click spring (115) over the heads of the two rear sight windage cap screws (112), having the notch on the lower side. Note the position of the hole in the end of the rear sight windage screw (121) and place the rear sight windage screw knob (120) on the rear sight windage screw (121) so that the rear sight windage screw knob set screw (119) will be in line with this hole. Press in on the rear sight windage screw knob (120) and screw in the rear sight windage screw knob set screw (119). There should be no movement of the rear sight windage screw knob (120) independent of the rear sight windage screw (121). Press in on the rear sight lock bolt knob (106) and push the rear sight slide (104) into its place in the rear sight base (122). Screw up the rear sight lock bolt knob (106).

17. Front sight group.—The front sight group includes fixed stud, movable stud assembly, and front sight screw.

a. The movable stud assembly consists of the movable stud, the front sight, and the front sight pin. This assembly assembled to the fixed stud is shown in figure 49, right side view and front view. The rear face (G) of both the fixed stud and the movable stud is serrated to prevent any reflection of light from the surface interfering with aiming the rifle.

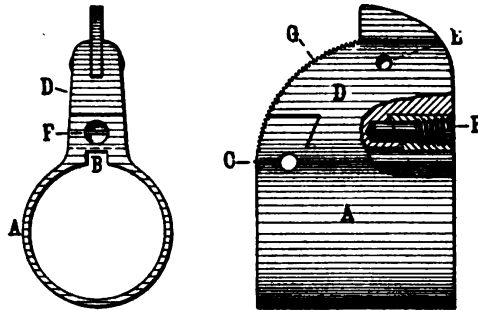
(1) The movable stud (D) has the front sight pin hole (E). It fits into the undercut slot in the fixed stud.

(2) The front sight (fig. 50) fits in a slot in the movable stud.

(3) The front sight pin (fig. 50) holds the front sight in position in the slot in the movable stud. The pin is tapered, and its small

end is driven in from the right. Both ends are then upset to prevent accidental removal.

b. The front sight screw (F) (fig. 49) secures the movable stud to the fixed stud and prevents the movable stud from being moved



Ord. 9602.

FIGURE 49.

laterally. The recess for this screw is not drilled in the movable stud until the correct position of the movable stud has been determined.

18. Barrel and receiver assembly.—The barrel and receiver assembly (fig. 51, top view, and fig. 52, right side view) is composed of the barrel assembly and the receiver. The barrel and receiver assembly, M1922MI, and the barrel and receiver assembly, M2, are identical except for the stamping on the upper surface of the front end of the receiver.



Ord. 9603.

FIGURE 50.

a. Barrel assembly.—The barrel assembly consists of the barrel, fixed stud, and fixed stud pin.

(1) The barrel is 24.505 inches in length, and the rifling consists of four plain grooves 0.0025 inch deep. The twist is uniform right hand, one turn in 16 inches. The muzzle is rounded to protect the rifling, and the tenon at the rear is threaded for the purpose of securing the receiver to the barrel. On top in rear of the fixed stud are stamped the ordnance escutcheon, the initials of place of manufacture, and the month and year. On the upper left hand side directly in front of the tenon threads is stamped "Long rifle cart'ge only."

(2) The fixed stud, to which is assembled the front sight group, is shown at (A), figure 49. The fixed stud has a slot (B) which, bearing on the lug on the upper side of the barrel, prevents lateral displacement of the stud and hole (C) for the fixed stud pin.

(3) The fixed stud pin enters the hole (C) of the fixed stud and by bearing in a slight recess on the top of the barrel prevents longitudinal displacement of the stud.

b. Receiver.—The receiver shown in figure 51, top view, and figure 52, right side view, has the hole (A), called the well, which receives the bolt; the magazine opening (B); the channel (C)

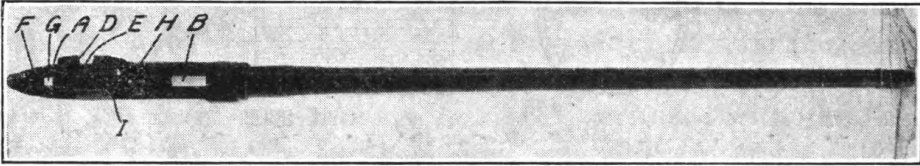


FIGURE 51.

Ord. 9604

for the guide lugs and ejector; the ejector stop seat (D); the ejector stop thumbpiece recess (E); the cocking piece groove (F); the sear nose slot (G); the magazine retaining spring lug hole (H); the locking shoulder (I); the extractor cam (J); the sear pin hole (K); the rear sight mounting screw holes (L); the tang (M) in which is the hole for the rear guard screw; and the recoil lug (N) in which is the hole for the front guard screw. On the upper

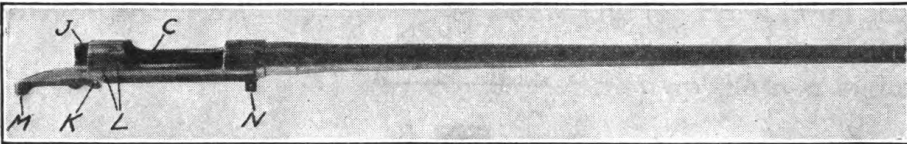


FIGURE 52.

Ord. 9605

surface of the front end of the receiver are stamped model of the rifle, place of manufacture, and serial number.

19. Butt plate.—*a. M1922MI and M2.*—The butt plate (fig. 53, right side view and rear view) has the toe (A), the tang (B), the hole for butt plate screw, large (C), the hole for butt plate screw, small (D), and the checking (E). The ears (F) and the lug (G) are of no use except in manufacture.

b. M1922.—Figure 54 shows the M1922 butt plate. This is the NRA type butt plate and is used on the NRA type stock.

20. Butt plate screws.—*a. M1922MI and M2.*—The butt plate screw, large (fig. 55), and the butt plate screw, small (fig. 56), secure the butt plate to the stock.

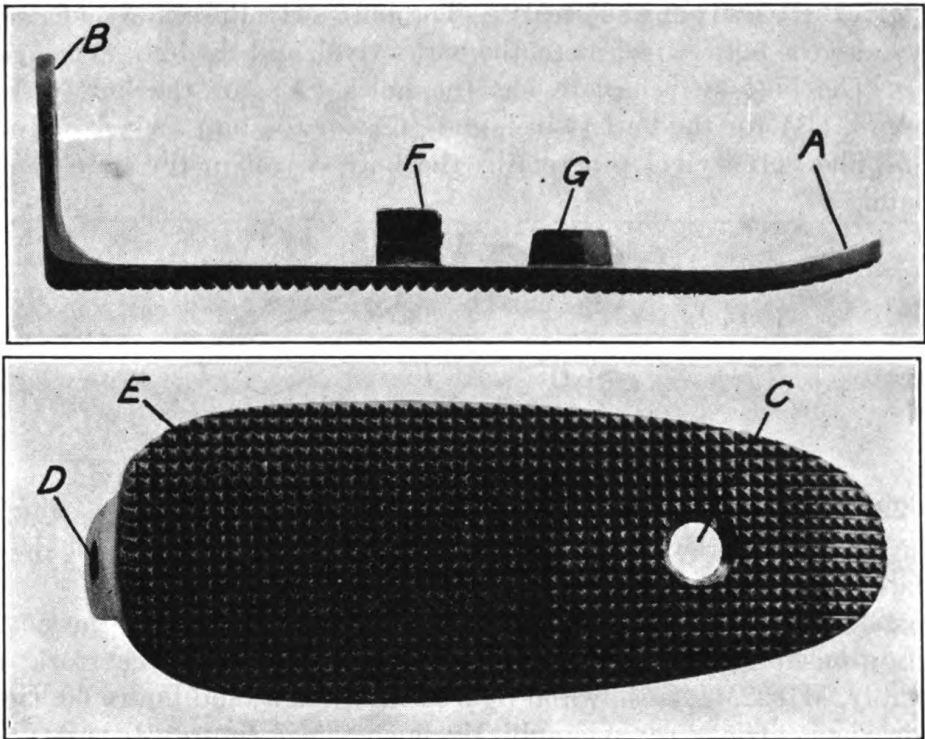


FIGURE 53.

Ord. 9606

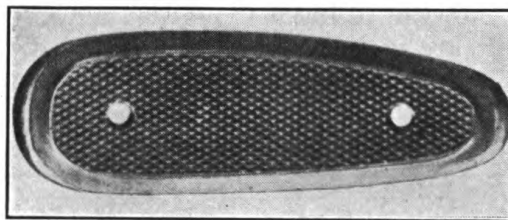


FIGURE 54.

Ord. 9607



Ord. 9608

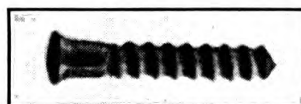
FIGURE 55.



Ord. 9609

FIGURE 56.

b. M1922.—The butt plate screw, M1922, is shown in figure 57. Two of these screws are used to secure the butt plate, M1922, to the stock, M1922.



Ord. 9610

FIGURE 57.

21. Butt swivel assembly.—The butt swivel assembly (fig. 58) includes the butt swivel plate, the butt swivel, and the butt swivel pin.

a. The butt swivel plate has the holes (A) for the butt swivel screws, (B) for the butt swivel, and (C) for the butt swivel pin.

b. The butt swivel pin retains the butt swivel in the butt swivel plate.

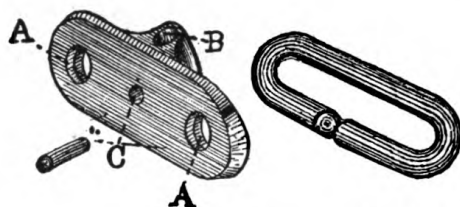


FIGURE 58.

Ord. 9611

22. Butt swivel screws.—The butt swivel screws are the same as the butt plate screw, small (fig. 56), and serve to attach the butt swivel plate to the stock.

23. Stock assembly.—The stock assembly consists of the guard screw bushing, the lower band pin, and the stock. The stock assembly, M1922MI, is shown in figure 59, top view, and figure 60, right side view. The stock assembly M2 is shown in figure 61, right side view. The stock assembly, M1922 (NRA type), is shown in figure 62, right side view. As the differences in the stock assemblies, M1922, M1922MI, and M2, are in shape and dimensions of the stock, the following description refers to figures 59 and 60 but applies to all three models of stock.

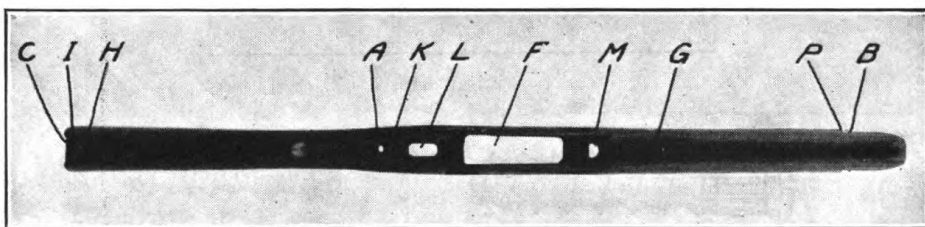


FIGURE 59.

Ord. 9612

a. The guard screw bushing (A) (fig. 59), fits tightly into the stock between the receiver and the rear tang of guard and serves as a stop for the guard screw, preventing its being screwed down tight enough to bend the guard.

b. The lower band pin (B) (figs. 59 and 60) fits tightly into the stock directly ahead of the lower band and serves as a stop to keep the lower band in place.

c. The stock (figs. 59 and 60) has the butt (C), small (D), pistol grip (E), magazine well (F), barrel bed (G), hole for butt plate screw, small (H), seat for the butt plate tang (I), butt swivel plate seat (J), mortise for receiver tang lug (K), mortise for sear and slot for trigger (L), mortise for recoil lug on receiver (M), clearance cut

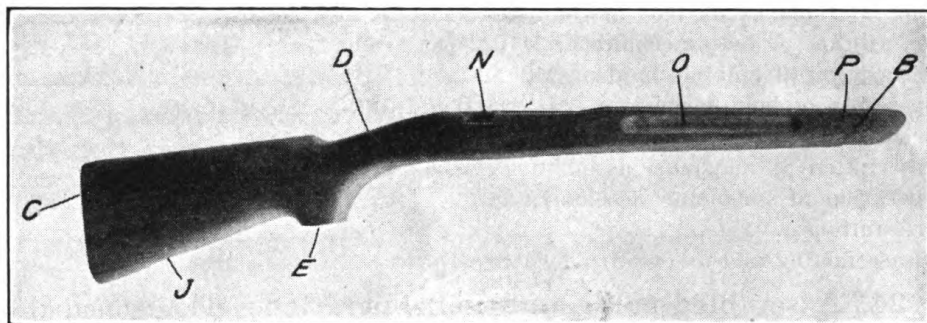


FIGURE 60.—Stock assembly, M1922MI.

Ord. 9613

for the rear sight assembly (N), grasping grooves (O), and shoulder for lower band (P). The stock, M2 (fig. 61), has "M2" stamped on the lower surface of the pistol grip. The stock, M1922 (NRA type) (fig. 62), does not have the hole for butt plate screw, small (H), the seat for butt plate tang (I), and the grasping grooves (O).

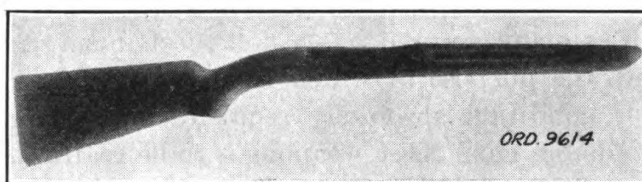


FIGURE 61.—Stock assembly, M1.

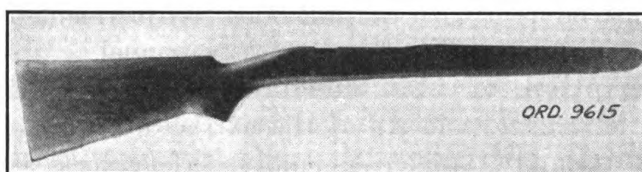


FIGURE 62.—Stock assembly, M1922 (NRA type).

SECTION V

MECHANICAL OPERATION, DISASSEMBLING, AND
ASSEMBLING

	Paragraph
Assembled parts and their operation.....	24
General remarks on bolt mechanism.....	25
Description of bolt mechanism, M1922MI.....	26
Description of bolt mechanism, M2.....	27
Operation of bolt mechanism, M1922MI and M2.....	28
General remarks on magazine mechanism.....	29
Description of magazine assembly.....	30
Operation of magazine assembly.....	31
Precautions.....	32
Disassembling and assembling by rifleman.....	33

24. Assembled parts and their operation.—The principal operating parts may be included under the bolt mechanism and the magazine assembly.

25. General remarks on bolt mechanism.—The bolt mechanisms pertaining to the U. S. rifle, caliber .22, M1922, M1922MI, and M2, are not interchangeable. The fact that a bolt mechanism not pertaining to a certain one of these rifles may be inserted in the receiver of that rifle and appear to fit must not be taken as an indication that the above statement has been contradicted. Each of these rifles when it is manufactured has a bolt mechanism carefully fitted to it by hand, the purpose of which is to obtain precise head space adjustment, a condition absolutely requisite if the high degree of accuracy obtainable from these weapons is to be realized. When it is required to replace a bolt in one of these rifles, the M2 bolt having the adjustable head space feature will be used. The M2 magazine assembly must be used with the M2 bolt. Adjustment of head space will be made only by qualified ordnance personnel.

26. Description of bolt mechanism, M1922MI.—The bolt mechanism, M1922MI, consists of the extractor, bolt head assembly, bolt handle assembly, striker assembly, safety lock assembly, bolt sleeve assembly, and firing pin assembly. This bolt mechanism is shown assembled in figure 63. The parts shown in figure 63 are the extractor (A), ejector (B), ejector retaining pin (C), guide lugs (D), bolt head (E), bolt head latch (F), bolt head latch plunger (G), locking lug (H), bolt (I), handle (J), cocking piece (K), bolt sleeve (L), and the safety lock (M). The bolt mechanism moves backward and forward in the well of the receiver; the bolt handle assembly is free to rotate, but the bolt head assembly is prevented

from doing so by the guide lugs and ejector being held in place in their slot in the receiver. The bolt head carries a cartridge, either from the magazine or one placed by hand in front of it, into the chamber and supports its head when fired. The bolt sleeve unites the parts of the bolt mechanism, and its rotation with the bolt handle assembly is prevented by the lugs on its sides coming in contact with the receiver. The hook of the extractor engages the rim of the cartridge case and retains the head of the latter in the recess of the bolt head until the case is ejected. The safety lock when turned to the left is inoperative; when turned to the right, which can only be done when the rifle is cocked, the point of the spindle enters its

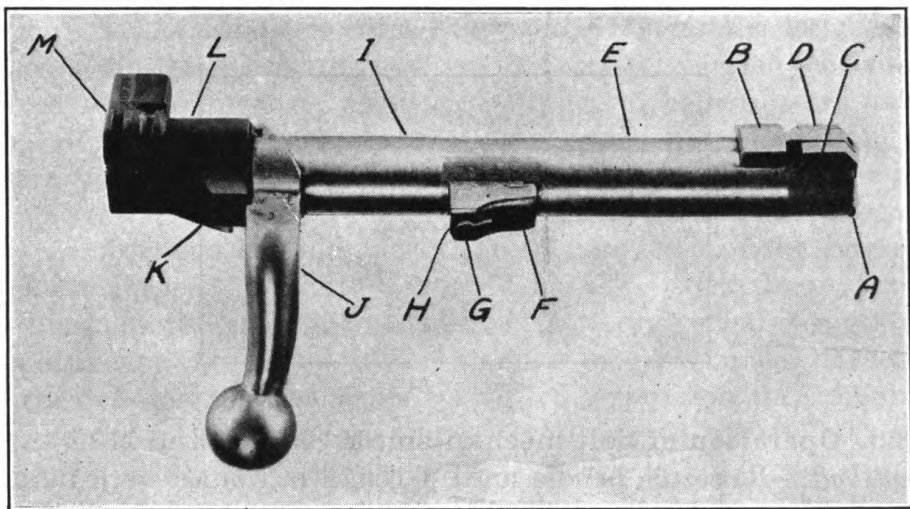


FIGURE 63.

Ord. 9616

notch in the bolt handle and locks the bolt; at the same time its cam forces the cocking piece slightly to the rear out of contact with the sear and locks the firing pin.

27. Description of bolt mechanism, M2.—*a.* The bolt mechanism, M2, consists of the extractor, bolt-head assembly, bolt-handle assembly, safety-lock assembly, bolt-sleeve assembly, cocking-piece assembly, and firing pin. This bolt mechanism is shown assembled in figure 64. The parts shown in figure 64 are the extractor (A), ejector (B), ejector retaining pin (C), guide lugs (D), bolt head (E), bolt handle (F), locking lug (G), head space adjusting screw (H), cocking piece (I), locking spring (J), bolt sleeve lock (K), bolt sleeve (L), safety lock (M), and the firing pin nut (N).

b. The M2 bolt mechanism is provided with a head space adjusting feature in the bolt handle which comprises a hardened steel screw having an Allen-type setscrew head (head space adjusting screw)

assembled into the longitudinal threaded hole in the locking lug of the bolt handle and a copper locking plug (head space adjusting screw locking plug) for holding the adjusting screw in place when the proper head space is obtained. All new rifles will have the bolt so adjusted when issued that the head space will be minimum, 0.043 inch.

NOTE.—The first rifles provided with the head space adjusting feature had an adjusting screw with a screw driver slot for adjusting the screw. This screw was held in place with a head space adjusting screw setscrew after the proper head space was obtained. In order to prevent possible loosening of the adjusting screw and tampering by unauthorized personnel, a small pellet of low melting point alloy metal was melted into the screw driver slot of the adjusting screw and into the threads of the recess over the slotted end of the adjusting screw.

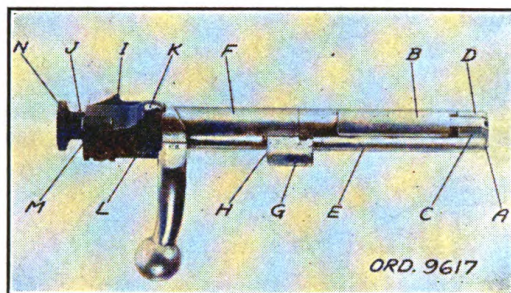


FIGURE 64.

28. Operation of bolt mechanism, M1922MI and M2.—a. To open bolt.—Raise the handle until it comes in contact with the left side of the receiver and pull directly to the rear until the ejector strikes the ejector stop. Raising the handle rotates the bolt and separates the locking lug from its locking shoulder in the receiver. This rotation causes the cocking cam of the bolt to force the firing pin to the rear, drawing the point of the striker into the bolt head, rotation of the firing pin being prevented by the lug on the cocking piece projecting through the slot in the bolt sleeve into its groove in the receiver. As the bolt sleeve remains longitudinally stationary with reference to the bolt, this rearward motion of the firing pin will start the compression of the mainspring. When the bolt handle strikes the receiver, the locking lug has been disengaged, the firing pin has been forced to the rear until the sear notch of the cocking piece has passed the sear nose, the cocking piece has entered the cock notch in the rear end of the bolt, the sleeve lock has engaged its notch in the bolt, and the mainspring has been almost entirely compressed. During the rotation of the bolt a rearward motion has been imparted to it by its extracting cam coming in contact with the extracting cam of the

receiver so that the cartridge case will be started from the chamber. The bolt mechanism is then drawn directly to the rear, the bolt handle and bolt head being held together and the other parts being retained in position by the cocking piece nose remaining in the cock notch and locked by the sleeve lock engaging its notch in the bolt. Just before the bolt is drawn fully to the rear, the rear face of the ejector strikes the ejector stop; as the bolt moves fully to the rear the ejector is forced ahead, striking the rear face of the cartridge case, ejecting the case slightly upward and to the right from the receiver.

b. To close bolt.—Push the handle forward until the extracting cam on the bolt bears against the extracting cam on the receiver, thereby unlocking the bolt sleeve from the bolt; then turn the handle down. As the handle is turned down, the cam of the locking lug bears against the locking shoulder in the receiver and the bolt is forced slightly forward into its closed position. The forward movement of the firing pin is prevented by the sear nose engaging in the sear notch of the cocking piece. This forward movement of the bolt completes the compression of the mainspring, seats the cartridge in the chamber, and in single loading forces the hook of the extractor over the rim of the cartridge case. In loading from the magazine, the hook of the extractor, rounded at its lower edge, engages the rim of the top cartridge as it rises from the magazine under the action of the follower and magazine spring. The position then occupied by the firing mechanism is shown in figure 65 (M1922MI) and figure 66 (M2), and the rifle is ready to fire.

c. The opening and closing of the bolt should be done by one continuous motion.

d. To cock rifle.—The rifle may be cocked by raising the bolt handle until it strikes the left side of the receiver and then immediately turning it down. It can also be cocked by pulling back on the cocking piece.

e. To fire rifle.—To fire the rifle, the fingerpiece of the trigger must be drawn to the rear until contact with the receiver is transferred from its bearing to the heel, which gives a creep to the trigger, and then until the sear nose is withdrawn from in front of the cocking piece. In firing, unless the bolt handle is turned fully down, the cam on the cocking piece will strike the cocking cam on the bolt, and the energy of the mainspring will be expended in closing the bolt, instead of on the cartridge head. This prevents the possibility of a cartridge being fired until the bolt is fully closed.

29. General remarks on magazine mechanism.—The magazine mechanism consists of the magazine assembly and the magazine

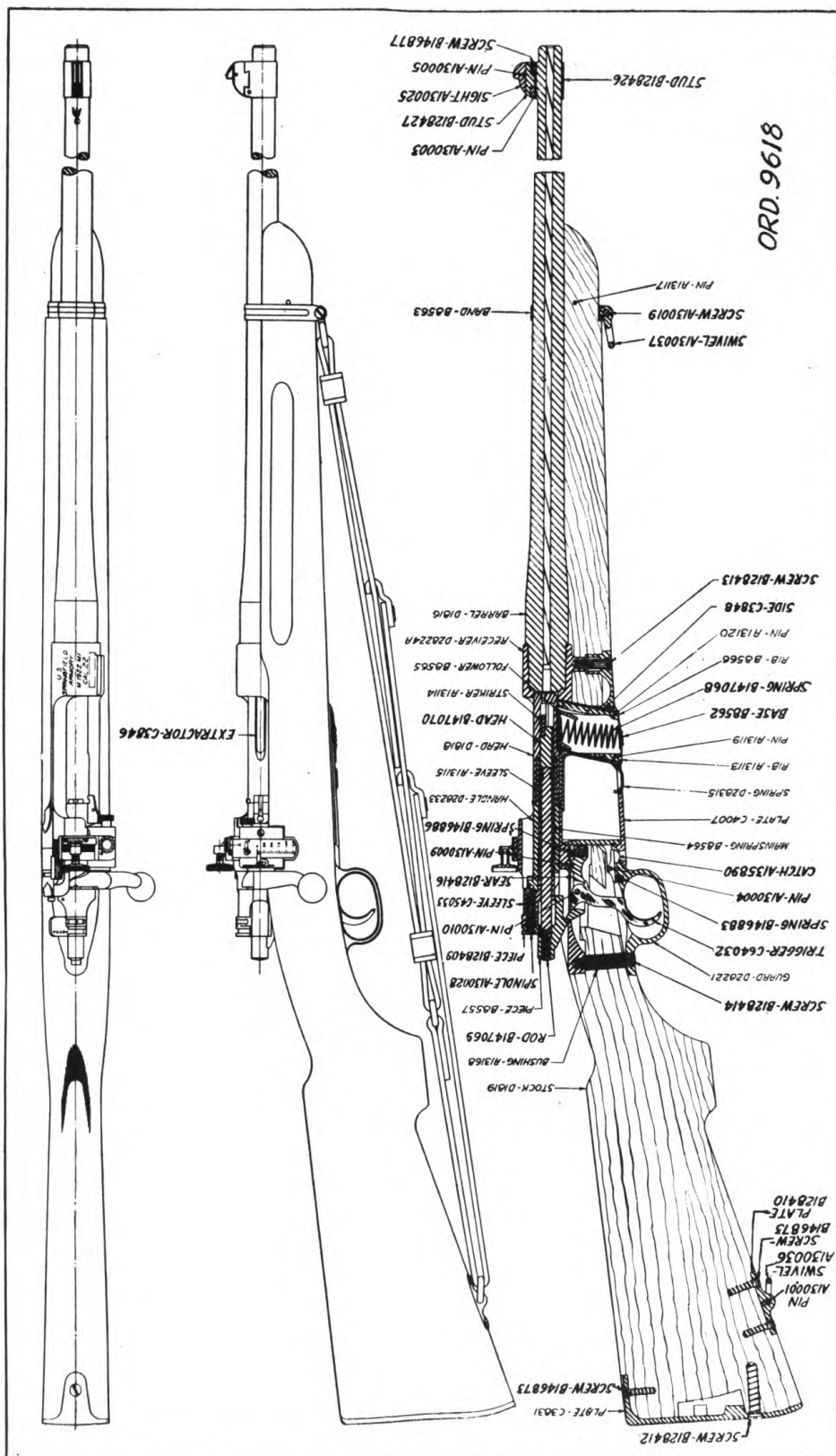
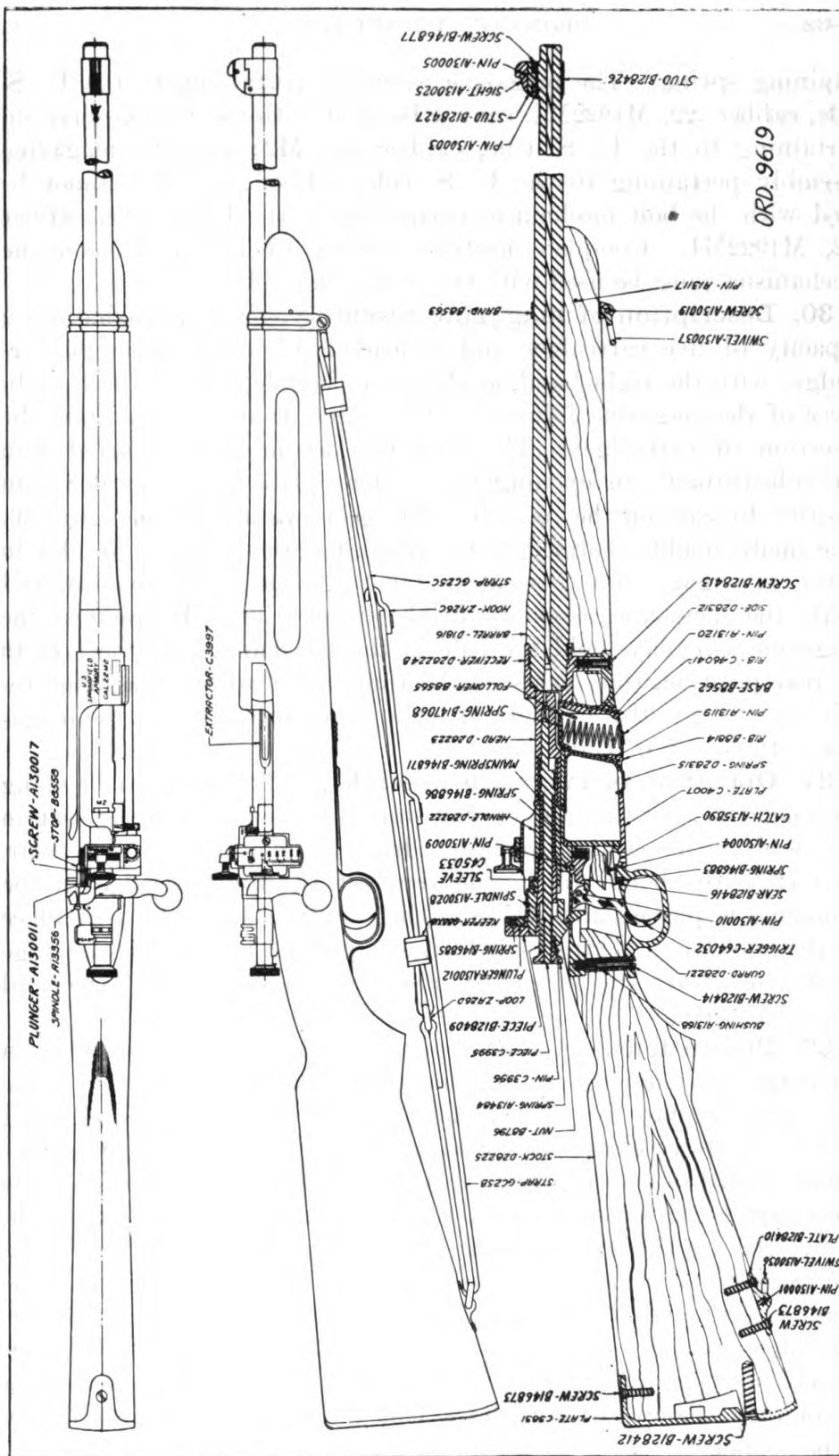


FIGURE 65.—U. S. rifle, caliber .22, M1922MI, sectional view.



ORD. 9619

Figure 66.—U. S. rifle, caliber .22, M2, sectional view.

retaining spring. The magazine assembly pertaining to the U. S. rifle, caliber .22, M1922MI, cannot be used with the bolt mechanism pertaining to the U. S. rifle, caliber .22, M2; and the magazine assembly pertaining to the U. S. rifle, caliber .22, M2, cannot be used with the bolt mechanism pertaining to the U. S. rifle, caliber .22, M1922MI. Complete units consisting of bolt and magazine mechanisms must be used with the pertaining rifle.

30. Description of magazine assembly.—The magazine has a capacity of five cartridges and is loaded by inserting single cartridges with the right hand, at the same time depressing the thumb-piece of the magazine follower with the left thumb to facilitate the insertion of cartridges. The magazine assembly is inserted into the rifle through an opening in the floor plate and is guided into position by ears on the retaining spring shown at (D) in figure 36. The small shoulder formed on the retaining spring shown at (E) in figure 37 engages a recess cut in the magazine tube assembly and holds the magazine assembly firmly in position. To remove the magazine assembly, hold the rifle in the left hand, pull the bolt to its rear position, then press on the thumbpiece of the magazine retaining spring with forefinger of right hand, and push out the magazine with thumb of right hand.

31. Operation of magazine assembly.—To load the rifle using the magazine, see that the ejector stop is turned up into its seat in the receiver, insert the magazine, draw the bolt fully to the rear, then close the bolt. In closing the bolt the top cartridge in the magazine is pushed forward into the chamber, being held in place by the hook of the extractor which engages the rim of the cartridge as it rises from the magazine under action of the follower and magazine spring.

32. Precautions.—*a. Bolt action, magazine loading.*—When a cartridge jams during loading, no effort should be made to force the cartridge into the rifle chamber. The bolt should be retracted and the feedway cleared by removing the jammed cartridge. Cases are on record of serious injury to personnel due to attempts to force the cartridge into the chamber, using undue force to close the bolt, or by striking the bolt handle.

b. Single-shot hand loading.—When inserting a cartridge into the chamber by hand it is essential from a safety standpoint that the cartridge be fully chambered *by hand* before closing the bolt. Merely starting the cartridge in the chamber and then attempting to complete the operation with the bolt has resulted in serious injury to personnel.

c. Carrying rifle cocked.—If it is desired to carry the rifle cocked with a cartridge in the chamber, the bolt mechanism should be secured by turning the safety lock to the right.

d. Ejection.—To obtain positive ejection, the bolt must be drawn fully to the rear with a quick motion so that the cartridge case will strike the ejector smartly.

e. Lubrication.—It is essential for proper working and preservation of all cams that they be kept lubricated.

f. Obstructions in barrel.—Never fire the rifle with rust-preventive compound or any obstruction, whether near the breech or the muzzle, in the bore.

g. Clearing feedway.—When a stoppage occurs with this rifle, the feedway will be cleared by removal of the jammed cartridge and under no circumstances will the firer attempt to force the cartridge into the rifle chamber by striking the bolt handle or by using undue force to close the bolt.

33. Disassembling and assembling by rifleman.—The bolt and magazine mechanisms can be removed and disassembled without removing the stock. The stock should never be removed except for making repairs and then only under the supervision of the Ordnance Department.

a. Removing the bolt mechanism, M1922MI and M2.—Cock the rifle and turn the safety lock to a vertical position; place the ejector stop at the middle notch; raise the bolt handle and draw out the bolt mechanism. See figure 67.

b. Disassembling bolt mechanism, M1922MI.—Proceed as follows:

(1) Hold bolt mechanism in right hand; press latch plunger in with thumb of right hand to unlock latch; turn bolt head with left hand slightly, either to right or left, and remove.

(2) To avoid bending extractor in removing it, hold the bolt head in left hand, pressing extractor against a bench; with right hand push point of a small screw driver under hook of extractor, force downward and up, and remove extractor from bolt head.

(3) Hold bolt handle in left hand; press bolt sleeve lock in with thumb of right hand to unlock bolt sleeve from bolt handle and unscrew bolt sleeve by turning to left. See figure 68.

(4) Hold bolt sleeve between forefinger and thumb of left hand; turn safety lock down to left with forefinger of right hand in order to allow cocking piece to move forward in bolt sleeve, thus partially relieving tension of mainspring; with bolt sleeve against the breast draw back firing pin sleeve with forefinger and thumb of right hand and hold it in position (fig. 69) while removing striker assembly with

left hand; remove firing pin sleeve and mainspring; pull firing pin assembly out of bolt sleeve.

c. Assembling bolt mechanism, M1922MI.—(1) With safety lock turned down to left to permit firing pin assembly to enter the bolt sleeve as far as possible, assemble bolt sleeve and firing pin assembly;



FIGURE 67.

Ord. 9252

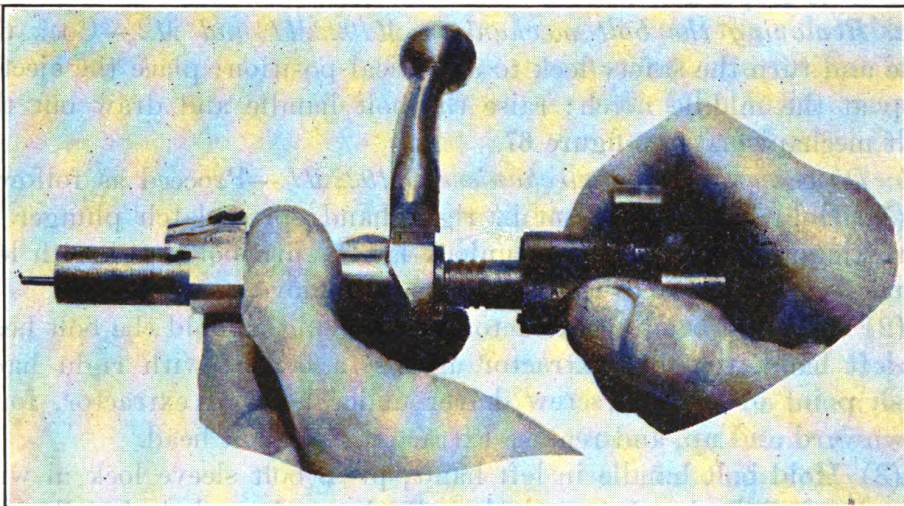


FIGURE 68.

Ord. 9248

place bolt sleeve against the breast and put on mainspring, firing pin sleeve, and striker assembly. (See fig. 69.) Hold bolt sleeve between thumb and forefinger of left hand and by pressing striker against some object, not hard enough to injure it, force cocking piece back

until safety lock can be turned to vertical position with right hand; insert firing pin in bolt handle and screw up bolt sleeve by turning to right until bolt sleeve lock enters its notch on the bolt handle.

(2) Hold bolt handle in left hand; turn safety lock down with forefinger of right hand; press on bolt sleeve lock with thumb of right hand; turn bolt sleeve to left, permitting firing pin assembly to move forward in bolt handle. Hold bolt head in left hand and bolt handle

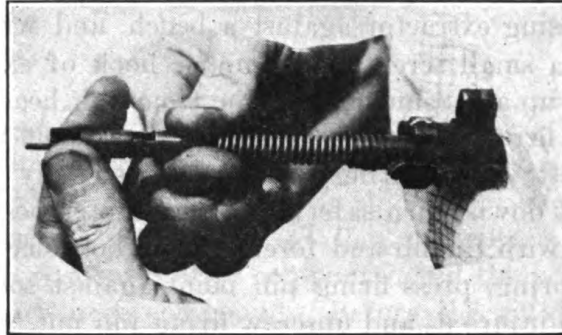


FIGURE 69.

Ord. 9254

in right hand so that ejector, bolt head latch, and ejector slot in firing pin head are in line with each other (see fig. 70); push bolt handle into bolt head as far as it will go; turn bolt head to left until bolt head latch engages latch lugs on bolt head. Hold bolt handle in left hand; press on bolt sleeve lock with thumb of right hand; turn bolt sleeve to right until bolt sleeve lock enters its notch in bolt handle.

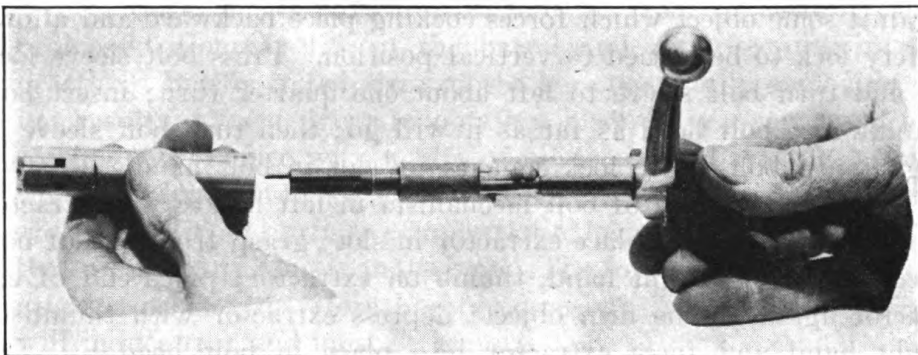


FIGURE 70.

Ord. 9247

(3) Hold rear end of bolt mechanism in left hand with extractor slot in bolt head up; place extractor in slot; grasp front end of bolt mechanism with right hand, thumb on extractor; place end of extractor against some firm object; depress extractor with thumb of right hand and force extractor into place in bolt head.

(4) See that ejector stop is at lowest notch; hold rifle in left hand; take bolt mechanism in right hand with locking lug up and push into receiver; lower handle of bolt and turn ejector stop thumbpiece up into its seat in receiver with right hand.

d. Disassembling bolt mechanism, M2.—(1) Hold bolt mechanism in left hand; press bolt sleeve lock in with thumb of right hand; turn bolt sleeve to left sufficiently to release latch lug on bolt head from locking lug on bolt handle; remove bolt head. Hold bolt head in left hand, pressing extractor against a bench, and with right hand push point of a small screw driver under hook of extractor; force downward and up and remove extractor from bolt head.

(2) Remove firing mechanism assembly from bolt handle by unscrewing to left; grasp firing mechanism assembly in left hand, firing pin point down; turn safety lock into center position and lock cocking piece; with thumb and forefinger on bolt sleeve and fingers holding mainspring, press firing pin point against some object, not hard enough to injure it, and unscrew firing pin nut, allowing mainspring to release slowly. The bolt sleeve and safety lock assembly, cocking piece, mainspring, and firing pin can then be separated.

e. Assembling bolt mechanism, M2.—(1) Assemble bolt sleeve and cocking piece with safety lock in center position; then assemble mainspring and bolt sleeve with cocking piece on firing pin; compress mainspring and screw firing pin nut on end of firing pin.

(2) Screw firing mechanism assembly into bolt handle until bolt sleeve lock engages its slot in bolt handle. Press firing pin point against some object which forces cocking piece backward and allows safety lock to be turned to vertical position. Press bolt sleeve lock in and turn bolt sleeve to left about one quarter turn; insert bolt handle into bolt head as far as it will go; then turn bolt sleeve to right until bolt sleeve lock engages its slot in bolt handle.

(3) Hold rear end of bolt mechanism in left hand with extractor slot in bolt head up; place extractor in slot; grasp front end of bolt mechanism with right hand, thumb on extractor; place end of extractor against some firm object; depress extractor with thumb of right hand and force extractor into place in bolt head.

(4) Hold rifle in left hand; see that ejector stop is at lowest notch. Take bolt mechanism in right hand with locking lug up and push into receiver. Lower bolt handle; turn ejector stop thumbpiece up into its seat in receiver; and turn safety lock down to either safe or ready position, whichever one is desired.

f. Removing magazine assembly, M1922M1 and M2.—Hold rifle in left hand; pull bolt to its rear position; then press on thumbpiece of magazine retaining spring with forefinger of right hand and push out magazine with thumb of right hand.

SECTION VI

CARE

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34. Cleaning.—*a. General.*—When the rifle is first issued it is covered with rust-preventive compound, and the bore is also slushed with rust-preventive compound. Before the rifle is fired all rust-preventive compound should be removed. The bore and chamber should be clean and dry. The breech mechanism should be thoroughly cleaned in all its parts, and each part should be wiped off with a cotton cloth very slightly oiled with aircraft machine-gun lubricating oil. Firing with rust-preventive compound in the bore may result in a bulged bore and ruined barrel. Firing with mechanism coated with rust-preventive compound will result in poor ignition and accuracy. Proper care of the bore requires conscientious, careful work, but it pays well in reduced labor of cleaning and in prolonged accuracy life of the barrel and better results in target practice. Briefly stated, care of the bore consists in removing fouling resulting from firing to obtain a chemically clean surface and coating this surface with a film of oil to prevent rusting. Fouling which results from firing is of two kinds; one, products of combustion of the powder and primer composition; the other, small flakes of lead that occasionally appear in the bore. The former is sometimes acid in its reaction and therefore highly corrosive. If of this character it will induce rust and must be removed. Even with noncorrosive ammunition it is best to remove fouling. Lead flakes themselves are inactive, but they may cover powder fouling and prevent action of cleaning agents until removed.

b. Method of removing powder fouling.—(1) The rifle is cleaned from the breech. The cut flannel patches provided for cleaning

caliber .30 weapons are cut into pieces about seven-eighths to three-fourths inch square, depending upon thickness of the flannel. The size of this square patch should be such that it fits the bore snugly but not so tight as to stick or become punctured by the rod.

(2) Center a dry patch over chamber of the rifle with tip of cleaning rod; push patch straight through the bore and out the muzzle; discard patch without pulling it back. This removes the bulk of black fouling from the bore and makes remainder of the cleaning much easier.

(3) Place rifle in a cleaning rack or rest muzzle on a piece of clean paper placed on the floor, barrel vertical, breech up. Wet a patch with water. Using cleaning rod, swab bore with this patch, pushing it through to muzzle (but not out) and pulling it back to breech about a dozen times. Repeat in same manner with two additional wet patches. This dissolves all injurious fouling. Fouling cannot be removed entirely with oil or solutions containing oil. Only aqueous solutions will suffice.

(4) Dry cleaning rod. Using dry flannel patches on rod in manner described in (3) above, swab bore until it is thoroughly dry. Usually about five or six patches will be required. The second patch should be cut a little smaller than usual, as when the bore is half dry it is rather sticky and a full-size patch is likely to become stuck in the bore. Do not use patches which are too tight nor patches of poor or thin material.

(5) Wipe mechanism and particularly breech of barrel and extractor cut in breech of barrel perfectly dry. This is particularly necessary when water is used for cleaning.

(6) Saturate a patch with rust-preventive compound (medium) and swab bore with it, leaving surface of the bore covered with a protective coating.

(7) Wipe bore dry within 3 days of original cleaning and apply a new coating of rust-preventive compound.

(8) Wipe all rust-preventive compound or oil from chamber and bore before starting to fire.

c. Method of removing lead flakes.—The small flakes of lead that occasionally appear in the bore can be readily and completely pushed out of bore by the same method used for removing powder fouling given in *b*(2) above, using a little tighter fitting patch. Should this not suffice, dip the brass wire bristle brush in oil and using cleaning rod carefully push the brush through the bore about five times.

35. General remarks on cleaning.—*a.* It is a fact that a highly polished steel surface rusts much less easily than one which is roughened; also, that a barrel which is pitted fouls much more rapidly than one which is smooth. Every effort therefore should be made to prevent formation of pits which are merely enlarged rust spots and which not only affect accuracy of the rifle but increase labor of cleaning.

b. In cleaning the rifle great care should be exercised not to injure the chamber as this is a most delicate part of a rifle barrel and particularly is this so of the caliber .22. If the chamber is burred or scratched, it will not only affect seating and extraction but it probably will cause the bullet to be so deformed that all semblance of accuracy is lost.

c. Always let cleaning rod turn with grooves when forcing through the barrel.

d. Many parts of the rifle generally can be cleaned with dry rags. After cleaning, all parts should be wiped with an oiled rag.

e. Any part that may appear hard to move generally can be freed by use of a little oil. The best method of applying oil is rubbing with a piece of cotton cloth upon which a few drops of oil have been placed, thereby avoiding use of an unnecessary amount. This method will also serve for cams and bearings which should be kept continually oiled. Particularly, each day before the rifle is fired the rear surface of the bolt handle locking lug, the surface of the receiver against which it locks, and the sleeve bearing between bolt head assembly and bolt handle assembly should be wiped dry and clean, and then a few drops of oil should be applied to these surfaces. These rifles are used continually in many organizations for a number of years, and many thousands of rounds are fired. They are therefore manipulated many more times than a caliber .30 ever is, and if these surfaces be not lubricated at all times, frictional wear will occur which will result in increase of head space to a point detrimental to the accuracy and safety of the weapon. This caution is particularly necessary when the rifle is used in a dusty or sandy locality. The interior bore of the bolt handle and bolt head and the firing mechanism assembly, however, should never have an excess of oil on them, as this would interfere with perfect ignition, and be detrimental to the best accuracy. These parts should be wiped clean and dry at frequent intervals, and should then be lightly wiped with a very slightly oiled cloth so that they will have just a slight

"shine" of oil. As the bore of the rifle when properly cared for will successfully withstand firing of over 100,000 rounds of ammunition without impairment of accuracy, proper care and lubrication of the breech mechanism as prescribed above are very important in order that there may be no wear from friction during the life of the barrel.

f. If gas escapes at the base of the cartridge, it will enter inside of the bolt handle and bolt head through the firing pin hole. In this case the bolt mechanism must be dismounted and the parts thoroughly cleaned. Before reassembling all parts should be wiped with an oiled rag.

g. The stock may be coated with raw linseed oil and polished by rubbing with the hand.

h. Lubricating oil for aircraft machine guns (Spec. U. S. A. 2-27) should only be used for lubricating metallic bearing and contact surfaces.

i. Rust-preventive compound, medium (Spec. U. S. A. 2-84 A), should be applied to the chamber, bore, and all metallic surfaces to prevent rusting when arms are stored or when not used for an appreciable length of time.

36. Attempted improvements by rifleman.—Attempts by the rifleman to improve functioning of the rifle should never be made as it has been adjusted with great care at time of manufacture.

a. Do not attempt to improve trigger action by working down sear or cocking piece.

b. Do not remove trigger guard screws. These screws should be kept screwed up very tightly at all times as otherwise the rifle will not shoot accurately.

c. Bolt or firing mechanism should not be exchanged by the rifleman under any circumstances. The bolt of another rifle will give a different trigger pull and probably change head space adjustment sufficiently to cause inaccurate shooting.

37. Repairs.—No repairs or alterations to the rifle by using arms are authorized except replacing of worn and broken parts. The bolt mechanism must not be replaced or head space adjusted by using arms. After long usage the striker point of the firing pin may become worn or deformed, or the mainspring may become weak, giving poor ignition and accuracy. If this occurs and replacement of these parts does not correct the difficulty, the rifle should be turned in to an ordnance establishment for gaging and repairs.

SECTION VII AMMUNITION

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38. General.—Information in this section pertaining to type of cartridges authorized for use in the U. S. rifle, caliber .22 M1922, M1922MI, and M2 includes a description of the cartridges, means of identification, care, use, and ballistic data.

39. Nomenclature.—Cartridges described herein are listed in SNL T-1. Standard nomenclature of ammunition is used in this manual whenever reference is made to specific items of issue. It should be noted that this nomenclature completely describes the cartridge as to type, caliber, and model. Its use for all purposes of record is mandatory.

40. Classification.—The caliber .22 ammunition authorized for use in this rifle may be classified as ball cartridges of the long rifle type. The cartridges are known as rim-fire cartridges because the priming composition is contained in a circular recess inside the rim of the cartridge case. Use of other than caliber .22 long rifle cartridge is prohibited in this rifle.

41. Firing tables.—Ballistic data are published herein in paragraph 49 and in *TM 9-1990, and will not be published separately.

42. Identification.—*a.* The caliber .22 long rifle cartridges are purchased by the Ordnance Department from several commercial manufacturers. They are all of the same appearance (see fig. 72) but differ slightly in shape of bullet, powder used, and ballistic qualities. For approximate weights, see paragraph 49. The cartridge consists of the case, priming composition, powder charge, and bullet. The cartridge case is made of gilding metal and is of the rim-fire type.

*See Appendix.

The priming composition and charge of smokeless powder may differ for each manufacturer. Ammunition purchased since 1928 contains a noncorrosive primer composition. The bullet is made of lead. Bullets of different manufacture differ slightly in shape but all weigh approximately the same.

b. Since all the cartridges for use in this rifle are of commercial design they do not have any model designation. The manufacturer of these cartridges can be determined by the following marks which are stamped on the head of the case:

Federal cartridges have an initial "F".

Peters cartridges have an initial "P".

Remington cartridges have an initial "U".

U. S. cartridges have the initials "U. S."

Winchester cartridges have the figure of a diamond.

43. Ammunition lot number.—Caliber .22 ammunition of recent manufacture has the manufacturer's lot number stamped on the wooden packing box. This provides a means of identifying and reporting any ammunition which may become defective.

44. Grade.—No grade is assigned to caliber .22 ammunition. All unserviceable ammunition will be destroyed locally. Instructions for the destruction of ammunition are contained in *TM 9-1900.

45. Marking.—Packing cases are marked with the manufacturer's name, and the quantity and type of ammunition. Containers of this ammunition are usually marked by the manufacturer with the caliber, type of ammunition, type of powder, and such trade names as "Cleanbore", "Lubaloy", "Rustless", "Staynless", "Tackhole", "Copperheads," etc. For information as to packing, see paragraph 52.

46. Care, handling, and preservation.—*a.* Small arms ammunition as compared with other types is not dangerous to handle. However, care must be observed to keep the wooden packing cases from becoming broken or damaged. All broken boxes must be immediately repaired and careful attention should be given that all markings are transferred to new parts of the box. In case the box contains a metal liner it should be air tested and sealed provided that equipment for this work is available.

b. Ammunition boxes should not be opened until the ammunition is required for use. Ammunition removed from its container, particularly in damp climates, is apt to corrode, thereby causing it to become unserviceable.

c. Protect ammunition carefully from mud, sand, dirt, and water. If it gets wet or dirty wipe it off at once. Verdegris or light corro-

*See Appendix.

sion if it forms on cartridges should be wiped off. However, cartridges should not be polished to make them look better or brighter.

d. Use of oil or grease on cartridges other than that applied by the manufacturer is prohibited.

e. Do not fire cartridges with loose bullets or otherwise defective rounds.

f. Do not allow ammunition to be exposed to direct rays of the sun for any length of time. This is likely to affect seriously its firing qualities.

g. Whenever cartridges are taken from original packing container they will be tagged so that in the event ammunition is not fired it can later be identified and be returned to its proper packing box.

47. Storage.—Whenever practicable small arms ammunition should be stored under cover. When necessary to leave it in the open, raise it on dunnage at least 6 inches from the ground, and cover it with a double thickness of paulin. Suitable trenches should be dug to prevent water flowing under the pile.

48. Authorized rounds.—*a.* The ammunition listed below is authorized for use in the U. S. rifle, caliber .22, M1922, M1922MI, and M2. For authorized use in training, see AR 775-10.

(1) Cartridge, ball, caliber .22, long rifle.

(2) Cartridge, ball, caliber .22, long rifle, National Match.

b. Use of caliber .22 short cartridge or other than caliber .22 long rifle cartridge (see fig. 72) is prohibited in this rifle. Such cartridges will be inaccurate and damage the rifle by causing erosion which will cause the rifle to function unsatisfactorily with its standard cartridge. Figure 71 shows results brought about by use of a shorter

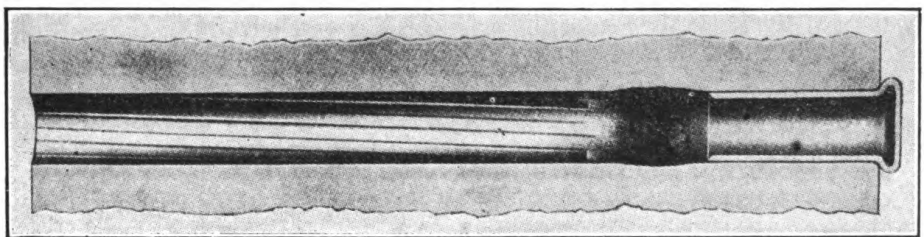


FIGURE 71.

Ord. 9624

cartridge than that for which the rifle was designed. Commercial manufacturers have recently brought out cartridges of the long rifle type known as hi-speed, hi-velocity, etc., which give high muzzle velocities and create high pressures. These high velocity cartridges are not issued by the Ordnance Department nor is their use recommended.

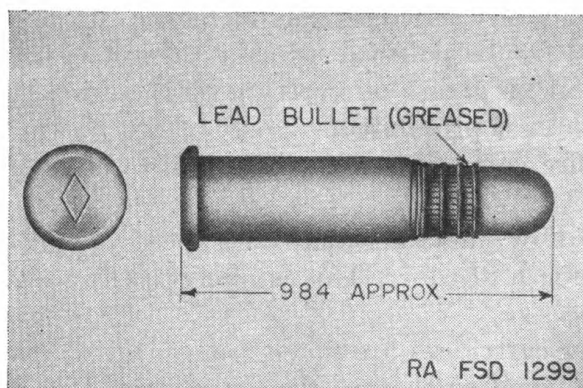


FIGURE 72.—Cartridge, ball, caliber .22, long rifle.

49. Data.—Although there are slight differences in cartridges of different manufacture (shape of bullet, powder, etc.), the following data are considered substantially correct.

a. General.

Muzzle velocity (approximate)-----feet per second-- 1,100

Maximum range at approximately 30° elevation
yards-- 1,500

Pressure in chamber (approximate)
pounds per square inch-- 16,000

Weight of ball cartridge (approximate)-----grains-- 53

Weight of bullet (approximate)-----do----- 40

Weight of powder charge (approximate)-----do----- 1.7

b. Table of fire.

Range (yards)	Veloc- ity (foot- seconds)	Bullet energy (foot- pounds)	Time of flight (seconds)	Drop at target (inches)	Ordinate of tra- jectory half range (inches)	Mean ac- curacy radius (inches)	Angle of de- parture (min- utes)
0---	1,097	102	-----	-----	-----	-----	-----
25---	1,071	95	0.068	0.89	0.24	0.14	3.5
50---	1,024	89	.140	3.17	.98	.33	7.6
75---	984	84	.214	8.06	2.28	.45	11.7
100---	950	79	.292	14.82	4.08	.57	15.8
125---	918	75	.372	24.73	6.78	.80	20.5
150---	891	71	.455	36.64	10.02	.98	24.9
175---	865	67	.541	50.80	14.20	1.13	29.6
200---	838	64	.630	72.93	19.10	1.25	34.3
225---	814	61	.720	93.04	28.30	1.45	39.7
250---	790	58	.812	118.21	31.87	1.65	44.7
275---	767	55	.911	147.20	39.87	1.88	30.8
300---	746	52	1.005	177.12	48.69	2.12	55.7

c. *Angles of departure.*

Range (yards)	Angle of departure	Range (yards)	Angle of departure
	<i>Degrees Minutes</i>		<i>Degrees Minutes</i>
100-----	16	900-----	6 13
200-----	36	1,000-----	7 44
300-----	1 01	1,100-----	9 32
400-----	1 32	1,200-----	11 41
500-----	2 10	1,300-----	14 16
600-----	2 56	1,400-----	19 00
700-----	3 51	1,450-----	25 00
800-----	4 56		

d. *Accuracy (as determined by firings to date.)*

Range (yards)	Diameter of group circle (inches)
25-----	0.5
50-----	1.0
100-----	3.0
200-----	8.0

e. *Elevation and windage changes.*—The rear sight elevating screw knob has 10 graduations. A click or half minute of angle corresponds to one graduation; a change of one graduation on this knob changes the point of impact vertically 0.5 inch at 100 yards. A click of the rear sight windage screw knob will change point of impact 0.5 inch horizontally at 100 yards. Changes in point of impact corresponding to one click of the rear sight windage screw knob or one click of the rear sight elevating screw knob at ranges from 50 to 200 yards are shown in the table below.

Range	Change at point of impact (inches)
50 feet-----	0.08
25 yards-----	.125
50 yards-----	.25
100 yards-----	.50
200 yards-----	1.00

f. Penetration.—When fired into 1-inch pine boards spaced 1 inch apart at a range of 15 feet, the bullet will penetrate the first five boards and $\frac{1}{8}$ inch into the sixth board.

50. Defects found after firing.—*a. Misfire.*—(1) Primer shows normal impression of firing pin. Such a misfire indicates that primer is defective.

(2) Primer shows normal impression of firing pin but not on rim. This is caused by a defect in the weapon.

(3) Primer shows light impression of firing pin. Such a misfire indicates that the force of the blow struck by firing pin was not sufficient to ignite primer. This is generally caused by some mechanical defect in the weapon such as short or broken firing pin, weak hammer spring, or by bolt of weapon not being completely locked, or by a bolt having so much grease on it that the blow of the firing pin is cushioned. It can also be caused by a defective cartridge or primer.

b. Hangfire.—Delayed ignition of powder in cartridge. This can be caused by a small or decomposed primer pellet, damp powder, or a light blow of firing pin caused by dirt or defect in the weapon. While a hangfire is a serious defect if the delay is long enough to permit the bolt to be opened before the powder burns completely, such delay is rarely found in practice. Should a hangfire of several seconds delay occur and the bolt be opened before the powder burns, injury to the firer or damage to the weapon or both, may result.

c. Pierced primer.—Perforation of primer by the firing pin. This may be caused by an imperfect firing pin or very thin metal in rim of cartridge case. There are various degrees of this perforation. A very small perforation will show escape of gas in or around the impression made by firing pin. The disk from a large perforation may be blown back into action of the gun with such an escape of gas as to lower velocity of the bullet.

d. Case leaked back.—Escape of gas into action of the weapon, discoloration due to this escape of gas being along body of cartridge case.

e. Case failed to extract.—This may be due to poorly formed or weak extractor or a defective cartridge.

f. Blowback.—An escape of gas under pressure to the rear is commonly referred to as a blowback. Pierced primer and ruptured cartridge are known as blowbacks. The solid wall of the receiver on the U. S. rifle, caliber .22, M1922, M1922MI, and M2, prevents injury to the firer should a blowback occur.

g. Split body.—A more or less regular longitudinal split in the body of the case which allows gas to escape.

h. Stretch.—A continuous ring around the body of a fired cartridge case which shows that the metal stretched when the cartridge was fired and that with slightly more stretching a complete or partial rupture would probably result. This is almost always due to improper head space.

i. Complete rupture.—A circumferential separation of the metal completely around the body of the fired cartridge case causing it to separate into two parts. If such a casualty occurs, upon extraction, the forward portion of the fired cartridge case remains in the chamber of the weapon. This is a very serious defect causing the next round of ammunition to jam. It is usually due to excessive head space or a defective cartridge case.

j. Partial rupture.—A partial circumferential separation of metal around the body of the fired cartridge case. Like a complete rupture, this is a very serious defect, as upon extraction the portion of the metal holding the two parts of the cartridge case may give way, thereby leaving the forward portion of the fired cartridge case in the chamber of the weapon. This defect is also due to excessive head space or a defective cartridge case.

51. Field reports of accidents.—Any serious malfunctions of ammunition must be reported promptly to the ordnance officer under whose supervision the material is maintained and issued (see par. 7, AR 45-30).

52. Packing.—*a.* The cartridges are packed 50 in a cardboard box and 10 of these boxes (500 cartridges) are packed in a paper carton. The outside wooden packing cases contain either 5,000 or 10,000 cartridges, 10 or 20 cartons, respectively. Boxes of this ammunition procured for oversea shipment have an airtight metal liner.

b. A case of 10,000 cartridges without metal liner weighs 85 pounds. A case of 5,000 cartridges without metal liner weighs 44 pounds. Additional data are published in SNL T-1.

SECTION VIII

ACCESSORIES

Accessories----- Paragraph 53

53. Accessories.—Accessories consist of cleaning rod, caliber .22, M1; cleaning brush, caliber .22; front sight cover; jeweler's screw driver; gun sling, M1907 (leather); and arm locked and arm chest.

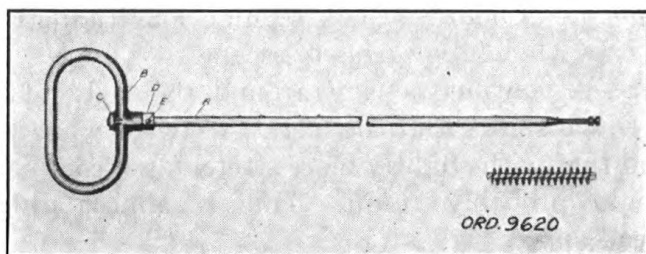


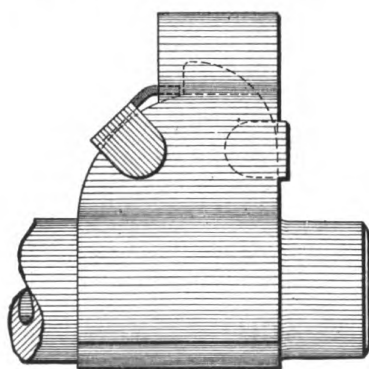
FIGURE 73.

a. The cleaning rod, caliber .22, M1, is shown in figure 73. It has the rod (A), the handle (B), the washer (C), the collar (D), and the pin (E). The cleaning rod is made of steel, and is of sufficient length so that the bore of the rifle can be cleaned from the breech end. The handle swivels on the rod between the washer and the collar.

b. The cleaning brush, caliber .22, shown in figure 73, is a bronze bristle brush $1\frac{1}{2}$ inches in over-all length. It consists of the core and bristles. The core made of brass wire is twisted in a spiral and holds the bristles in place.

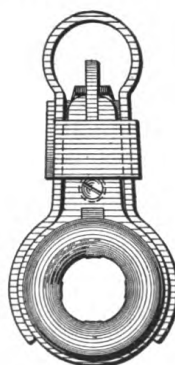
c. The front sight cover (fig. 74, right side view, and fig. 75, front view) is made of sheet steel and pressed into shape. It is then case-hardened, giving it sufficient spring to cause it to hug closely the barrel and front-sight stud, thereby retaining its position on the barrel.

d. The jeweler's screw driver is a small screw driver used to disassemble and assemble the Lyman receiver sight when installing the antiaircraft rear sight aperture for use in antiaircraft training. Care should be taken in the use of this screw driver, making sure



Ord. 9621

FIGURE 74.



Ord. 9622

FIGURE 75.

that more pressure than twist is exerted, otherwise damage will result to the screw heads. The screw driver is about $3\frac{3}{4}$ inches long

and is made up of the shank, head, and blade. The shank made of brass is knurled nearly its entire length and has firmly fixed in one end a steel blade 0.07 inch wide. On the opposite end is riveted the head assembled so as to swivel on the shank.

e. The gun sling, M1907 (leather) shown attached to the U. S. rifle, caliber .22, M2, in figure 76, has the leather strap, long (A), and the leather strap, short (B), joined together by the metal loop (C). On one end of each of these straps is a metal hook (D) fastened to the strap with rivets (E). In order to get the proper adjustment of the gun sling, the hooks are inserted into holes which are provided in the long and short straps for this purpose. The sliding loops (F) which are made of leather serve to keep the leather strap loop in position on the rifleman's arm after proper adjustment has been made to the gun sling.

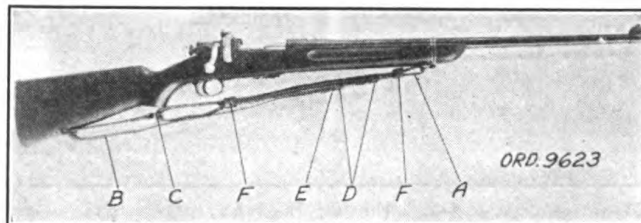


FIGURE 76.

f. The arm locker for the U. S. rifle, caliber .22, is shown in figure 77. This locker holds ten rifles and is issued for safekeeping surplus rifles of a company or troop. It is made of wood and is provided with metal strap hinges and two spring locks which secure the cover to the body of the locker.

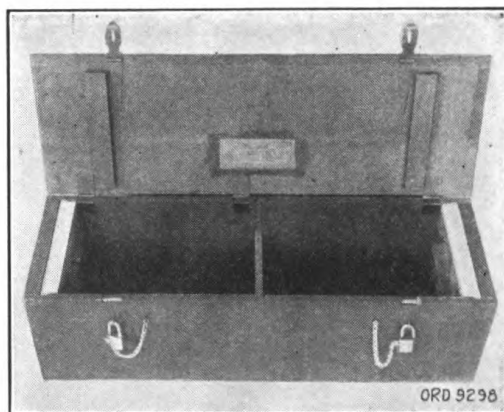


FIGURE 77.

g. As no arm chest for the U. S. rifle, caliber .22, has been approved, the rifles are packed in modified M1917 packing chests. The chest

holds 10 rifles. End fillers, end spacers, and improvised packing blocks are provided for the purpose of securely holding the rifles in place in transportation. Rifles should never be shipped in these chests unless all of the packing blocks have been properly assembled with the rifles in the chests. Figure 78 shows the arm chest.

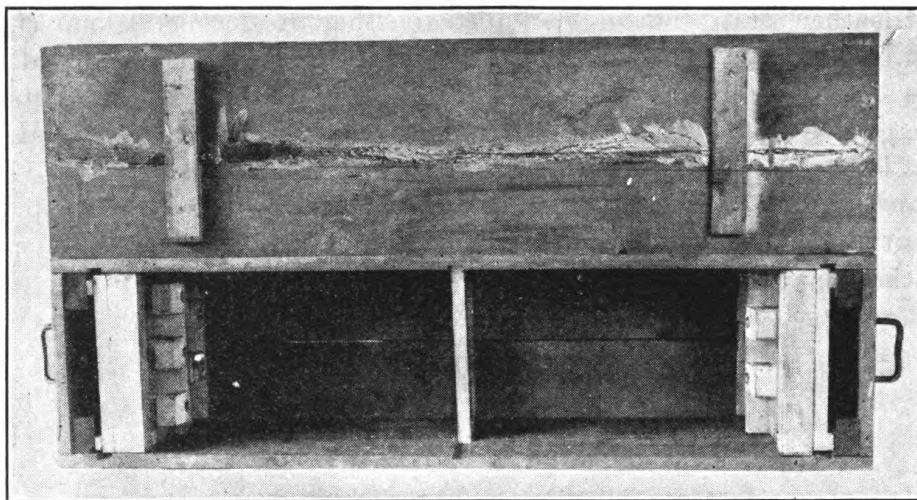


FIGURE 78.

Ord. 9259

APPENDIX

LIST OF REFERENCES

1. **Standard Nomenclature List.**

SNL B-17, Rifle, U. S. Cal. .22, M1922, M1922MI, and M2.

2. **Technical Manuals.**

TM 9-850, Cleaning and preserving materials. (Now published as TR 1395-A.)

TM 9-860, Construction of small-bore target ranges. (Now published as TR 1340-B.)

TM 9-1900, Ammunition, general. (Now published as TR 1370-A.)

TM 9-1990, Ammunition for small arms and automatic guns. (Now published as TR 1350-A.)

3. **Field Manuals.**

FM 23-5, U. S. Rifle, Caliber .30, M1.

FM 23-10, U. S. Rifle, Caliber .30, M1903.

4. **Army Regulations.**

AR 850-100, Promotion of rifle practice.

AR 850-110, Rifle competition in schools and colleges.

[A. G. 062.11 (8-28-40).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

E. S. ADAMS,
Major General,
The Adjutant General.

